The Role of Seed Patents in International Development:
A Critique from Catholic Social Thought

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If the Christian community continues to pray, "Give us this day our daily bread," should we not consider carefully the economic, political, social, cultural, personal, and religious dimensions of the food system?

- David Andrews, CSC and Rev. Raymond L Burke, "The Church and the Current Crisis in Rural America: A Time to Act," http://www.ncrlc.com/ncrlc-RP-webpages/andrburk_article.html.

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I: Introduction

In his 2009 encyclical letter *Caritas in Veritate*, released 10 months into a global economic crisis characterized by the breakdown of trust in markets, Benedict XVI warns of a purely utilitarian strategy of international and personal development:

> A person's development is compromised if he claims to be solely responsible for producing what he becomes. By analogy, the development of peoples goes awry if humanity thinks it can re-create itself through the “wonders” of technology, just as economic development is exposed as a destructive sham if it relies on the “wonders” of finance in order to sustain unnatural and consumerist growth. In the face of such Promethean presumption, we must fortify our love for a freedom that is not merely arbitrary, but is rendered truly human by acknowledgment of the good that underlies it.[1]

Freedom for Benedict is arbitrary where its outcome is disconnected from truth about God and about human communities. Unnatural, consumerist growth is not only unsustainable but a sham, a false exercise of freedom. Conversely, true exercises of freedom acknowledge essential human goods as their ends. Among the chief human ends is the production of food:

> Feed the hungry is an ethical imperative for the universal Church, as she responds to the teachings of her Founder, the Lord Jesus, concerning solidarity and the sharing of goods. Moreover, the elimination of world hunger has also, in the global era, become a requirement for safeguarding the peace and stability of the planet ... The right to food, like the right to water, has an important place within the pursuit of other rights, beginning with the fundamental right to life. It is therefore necessary to cultivate a public conscience that considers food and access to water as universal rights of all human beings, without distinction or discrimination.[2]

The farming vocation has ultimately preceded the development of civilization around the world: with a food supply secured, peoples are free to grow and develop their moral, intellectual and spiritual impulses.

The rapid development of the global north contrasted with the relative underdevelopment of the global south over the last century have, not surprisingly, dramatically altered the food system. “The poorest two-thirds of humanity live in what can be appropriately called the biodiversity-based economy."[3] For the poorest, many of whom are subsistence farmers, the continued viability of agricultural production on the small scale, using a diverse array of crops is a source of great concerns. The patenting of seeds, a trend begun in the United States during the 1930s and spread by international trade rules, threatens traditional farming practices. Noted seed patent critic Vandava Shiva identifies three concerns: first, that the enclosure of an intellectual and biological commons creates both material and intellectual poverty in the global south; second, that the "biological and natural resources of communities" in the global south are often freely taken by companies in the global north; and finally, that the intellectual and cultural heritage of communities are claimed by companies without their investment in those communities.[4] Each of these concerns raises questions about the impact of seed patenting: seen as part of a development strategy which glorifies technological agriculture exclusively, the freedom to patent quickly becomes a freedom to profit excessively from the production of a basic human need.

In 2000, Archbishop Agostino Marchetto of the Holy See's diplomatic corps observed the disconnect between the true ends of biotechnologies – resolving crises like global hunger – and the means by which corporations often deploy those technologies:

> [B]iotechnologies appear increasingly to respond to the demands of the market and to corresponding claims rather than to the real needs of developing countries. A study of markets becomes fundamental, then, for determining if and how biotechnological procedures might be used without limiting or compromising social needs, economic returns and the productive capacity of traditional systems in developing countries. This for us is the great human question, which becomes a Christian question as well.[5]

With regard to seed patents, this paper proposes to undertake that study. Beginning with the principle of authentic human development articulated in Pope Paul VI's *Populorum Progressio,*[6] this paper uses Catholic social thought as a framework by which to critique the effects of seed patenting on the viability of agriculture around the world. Chapter II examines the current debate in both secular and curial circles on seed patents, paying particular attention to the controversy surrounding the best way to combat global hunger. Chapter III proposes three paradigms on farming in Catholic social thought, each of which are to some degree violated by seed patents. Chapters IV and V explore these specific critiques in greater detail, arguing seed patents lead to the unjust appropriation of intellectual property from indigenous communities and that undue restrictions on the reuse of patented seeds inhibit the freedom of individual farmers, ultimately undermining the financial viability of subsistence and small farming. Chapter VI examines proposed policy reforms and existing human rights frameworks, assessing the need for each in light of the paradigms proposed in Chapter III. The paper concludes with a brief assessment of the legacy of Norman Borlaug, the noted "father of the Green Revolution" whose death in 2009 provoked a renewed examination of the means by which the global hunger crisis should be resolved.

Notes

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1 Benedict XVI, *Encyclical Letter Caritas in Veritate of the Supreme Pontiff Benedict XVI to the Bishops, Priests and Deacons, Men and Women Religious, the Lay Faithful and All People of Good Will on Integral Human Development in Charity and Truth* (Vatican City, June 29, 2009), http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html, sec. 68. Emphases and footnotes have been removed from papal encyclicals and other church documents except where noted.

2 Benedict XVI, *Caritas in Veritate*, 27.

3 Vandana Shiva, "Biopiracy: The Theft of Knowledge and Resources," in *Redesigning Life? The Worldwide Challenge to Genetic Engineering*, ed. Brian Tokar (Ithaca, NY: McGill-Queen's University Press, 2001), 283.

4 Ibid., 283-4.

5 Agostino Marchetto, "Address to the Convention Organized by the Catholic University of the Sacred Heart on the Theme 'New Frontiers for Bioethics: The Biotechnologies,'"(address, Catholic University of the Sacred Heart, Rome, November 18, 2000), http://www.vatican.va/roman_curia/secretariat_state/documents/rc_seg-st_doc_20001118_marchetto-univ-sacred-heart_en.html.

6 For an alternative framework which examines seed patents through the four chief forms of economic justice identified in Catholic social thought, see: Johannes J Britz and Tomas A Lipinski, "Indigenous Knowledge: A Moral Reflection on Current Legal Concepts on Intellectual Property," *Libri* 51 (2001): 234-246.

II: The Church's Debate on Life Patents – A Literature Review

On May 15, 2009, members of the Pontifical Academy of Sciences, scholars and invited guests began a four day meeting in Rome to study “Transgenic Plants for Food Security in the Context of Development.” A study document outlines the goals for the conference: to demonstrate why food security for the world's poorest requires access to genetic modification technology, show “the social and economic consequences of over-regulation” and propose regulatory changes which move away from ideology and towards science.[1] Biotechnology, the document's introduction says unreservedly, “has a great potential to improve the lives of the poor.”[2] The conference agenda included papers titled “Unjustified Regulation Delays Use of Golden Rice for 10 Years”, “GMO Myths and Realities, “Benefits of GM Crops for the Poor,” and “Financial Support of Anti-GMO Lobby Groups.” Opposition to genetic engineering, the document says, is worldwide and “radical”[3]; one paper presented at the conference describes an international “protest industry which serves its own interests, and the interests of its funders.”[4] Many of the papers base their conclusions on vitamin A rice, a genetically engineered crop developed in the public domain to remedy one aspect of malnutrition. Of the fifteen papers presented at the conference, none took a negative or neutral position on the promise of genetically engineered seeds to solve the global hunger and energy crises.

The Pontifical Academy of Science's exploration of genetic engineering began with a similar conference held in 2004 entitled “Feeding a Hungry World: The Moral Imperative of Biotechnology,” a title which concerned many advocates in the global hunger and environmental community due to its explicit endorsement of biotechnology and genetically engineered (GE) foods as a solution to the global hunger crisis.[5] While the 2004 study document provided a qualified endorsement of biotechnology, recognizing the need to provide poor farmers with access to crops specifically developed for their regions and greater financing for research, the conference came to a similar conclusion in 2004 on the need to reduce regulatory barriers. The Academy, a body of 80 academics across all religious affiliations, may not necessarily represent the interests of the Church at large. Brother David Andrews, former senior representative of the National Catholic Rural Life Conference and current executive director of Food and Water Watch, argues that conflicts of interest between international agricultural firm Monsanto and Academy members contributes significantly to the slant of the conferences: the debate over GM foods is "an embarrassing episode for the academy."[6] Columbian missionary Fr. Sean McDonaugh led a counter-demonstration in Rome during the 2009 conference, charging the Academy with ignoring the role that massive profits play in the biotechnology industry.[7] The Academy admits its disposition favors biotechnology. "As is obvious from the programme," the Academy concedes, "this is not a standard 'science' meeting. It is designed to present the potential of plant genetic engineering and to analyse the hurdles responsible for the fact that, so far, product applications to benefit small-scale farmers have mostly excluded the public sector."[8] Professor Bruce Chassy, a delegate to the meeting, argued in an interview that the "science is pretty clear" on the safety of GM foods and charged critics with paternalism towards Africa.[9] In response to McDonagh, who criticized the Academy for not inviting biotechnology critics to the meeting, Chassy said "[t]his is not a 'balanced' meeting, in the sense that you bring every point of view to the table and seek some kind of idiotic consensus."[10]

Hunger, Biotechnology and Patenting

Both sides of the debate over genetic engineering agree that global hunger is a pressing issue which requires a concerted effort by the developed world. Between 2006 and 2007, the number of food insecure people globally rose from 849 million to 982 million. USDA estimates that, by 2017, the number of hungry in the seventy countries which represent the global south will hit 1.2 billion.[11] Genetic engineering, proponents argue, provides a much-needed tool in the fight against hunger by utilizing the world's most innovative science to produce crops which are easier to plant, provide higher yields, and feed more people. Additionally, genetic engineering allows crops like vitamin A rice, which have been enhanced to provide the nutrients deemed necessary in a particular situation. Of critical importance to advocates of genetic engineering are patent rights. Utilizing the traditional defense for patent protection – that little or no economic incentive to create new products exists where others have an equal opportunity to sell those products[12] – genetic engineering advocates trumpet a sense of corporate social responsibility which allows companies like Monsanto, they say, to develop crops for both the developed and developing world while offering the latter a significant discount. With world population at all-time highs and the number of agricultural workers at all-time lows, they argue, only genetic engineering can provide the scalability necessary to feed the world.

Scientific evidence on biotechnology is far less unified than the Academy's members suggest. ETC Group, a Canadian biodiversity advocacy organization, critiques U.S. and European agricultural policies, which have subsidized the international agricultural trade rather than developing local agriculture, deluging the global south with food produced elsewhere. While in the 1960s, the developing world had an agricultural trade surplus around $7 billion a year, that surplus disappeared by 1990 and has remained a trade deficit through this decade.[13] As a result of the deterioration of local agricultural production, biodiversity advocates argue, the world's poor have lost their best potential source of income, and have fled to ghettos in large cities searching for the jobs they need to buy food from the global north. Among the world's bureaucrats, it is a common understanding that lack of money, not lack of food, is the underlying cause of the international hunger crisis.[14] As Fred Kirschenmann, fellow of the Leopold Center for Sustainable Agriculture at Iowa State University puts it, “We can no longer have a small group of people who control the technology and the resources to produce food, that make all of the decisions and decide what kind of food and how the food is going to get to the world … Feeding the world was the old paradigm; enabling the world to feed itself is the new paradigm.”[15]

Science increasingly questions the potential for GE foods to dramatically increase food yields. A 2009 study by the Union of Concerned Scientists found no increase in the yields for GE soybeans and only marginal increases in the yields for GE corn.[16] Even these increases, the report argues, have come largely due to factors unrelated to genetic engineering, including traditional breeding and improvements in the method of planting and harvesting. The report distinguishes between intrinsic yield, the highest yield that can be achieved under ideal conditions, and operational yield, achieved under field conditions “when environmental factors such as pests and stress result in yields that are considerably less than ideal.” While genetically engineered crops are formatted to achieve stronger operational yield, none of the GE crops tested increase the intrinsic yields necessary to dramatically impact global hunger. [17] While GE crops may be more resilient to pests or weather, they do not produce more food. Agricultural methods which rely on few external inputs, such as organic farming, have greater potential to increase yields in Africa because they are based on knowledge, which is more accessible to the world's poor than technology.[18] The farm-bred crops on which the world has relied for most of its history, ETC Group argues, are “diverse, patent-free, decentralized, and adapted to thousands of cultural, environmental, climate and geographical conditions.”[19] Vitamin A rice, the genetically engineered crop widely praised by papers at the Academy's conference, is not without critics. Vandava Shiva argues the crop actually contributes to hunger and malnutrition by forcing farmers in the global south to over-allocate resources for minimal nutrient production.[20] Global hunger cannot be resolved, these advocates argue, through crops designed to grow under optimal conditions in North America and Europe. Instead, concerted research and investment in local agriculture has the dual effect of providing the yields necessary to feed the world and stimulating third world economic development.

In particular, the patenting of genetically engineered seeds is a significant concern for international development. As of 2007, patents in the form of plant variety protections are held on some 72,000 plant varieties worldwide.[21] When seeds or seed varieties are owned by companies through patents, companies have the ability to control or even prevent research which could produce new varieties beneficial in the global south.[22] Companies who patent seeds discovered in the global south may inadvertently or purposefully also retain the rights to traditional uses of those plants essential to the livelihoods of indigenous cultures. Seed ownership criminalizes the practice of saving seeds in order to trade or replant them the next season; an estimated 75% of farmers routinely save seeds, and 1.4 billion people depend on the continued financial stability of farmers who do so.[23]

Finally, concentration of seed ownership threatens the autonomy of local farmers, who are forced to buy seeds every season from a handful of companies with whom they are largely powerless to negotiate for competitive prices. Of the top ten seed companies, responsible for two thirds of the seed market, only two firms (both Japanese) are outside of the U.S. or western Europe.[24] Within that market is further concentration: the top two seed companies, Monsanto and DuPont, own 23% and 15% of the market respectively. Some 82% of the seed market as a whole is now subject to patent claims, a portion of the market valued at $22 billion. Companies which control seeds also control the inputs necessary to grow those seeds. Of the top ten seed companies, four are also among the top ten pesticide companies[25] and seed industry leader Monsanto is also the world's third largest biotechnology firm.[26] As discussed in Chapter V, the power to genetically engineer crops and patent the result allows seed companies to control not only the present but the future direction of crop innovation, potentially creating a cycle of dependency which makes individual and family farming economically impossible.

McDonagh is perhaps the most significant Catholic advocate questioning the role of GE foods in international development. McDonagh's presence at the 2009 Academy conference was one of a series of actions he has taken against the Academy and the Pontifical Council on Justice and Peace's apparent endorsement of biotechnology. McDonagh also focuses on the ties of U.S. government officials involved in agriculture regulation to the biotechnology lobby and the increasing consolidation of the food industry. He, too, is skeptical of vitamin A rice: noting that the crop is already under some 70 patents owned by Syngentia (formerly AstraZeneca), McDonagh argues that corporate pressure produces perverse incentives to reap profit instead of developing solutions for the global south.[27] McDonagh's critique is at once secular and theological, relying heavily on work by scholars like Shiva but rooted in Biblical Christianity. Like many environmental theologians, McDonagh connects stewardship with the Eucharist.[28] Life as understood in the Bible, McDonagh argues, has a communitarian dimension which patenting rejects.[29] Save one passage on rights and responsibilities,[30] however, McDonagh does not turn to Catholic social thought as a resource for understanding the role property plays in a society oriented toward the common good.

Interventions of the Roman Curia on Intellectual Property

Curial statements on biotechnology and intellectual property (IP) have shifted in the last decade to emphasize the “social mortgage” principle and call for greater responsibility in the use of genetic engineering. While organizations like the Pontifical Academy on Sciences and the Pontifical Academy for Life – which gave a "prudent yes" to biotechnology in 1999[31] - have issued non-magisterial teachings in support of GE foods, the curia at large has shown hesitation specifically regarding the patenting of life. The attention of the Holy See towards IP issues began during the World Trade Organization's Ministerial Conference of 1999 in Seattle, which became infamous for provoking large street protests and underwhelming progress on negotiating trade rules between developed and developing countries. The Holy See's delegate to the conference, Msgr. Oswaldo Neves, raised five objections to life patents: the potential of patents to dampen research, the monopoly of knowledge held by the industrialized north, the incentive to work against social needs produced by the profit motive, the undue appropriation of indigenous knowledge, and the potential for small farmers to become dependent upon seed companies.[32] Neves' objections match the critiques raised by secular anti-GMO advocates nearly point for point.

The Pontifical Council for Justice and Peace's 2004 “Compendium of the Social Doctrine of the Church” devotes significant attention to biotechnology, specifically calling for the responsible use of natural materials: “[N]ature is not a sacred or divine reality that man must leave alone. Rather, it is a gift offered by the Creator to the human community, entrusted to the intelligence and moral responsibility of men and women … [Scientists] must not forget that their activity concerns material — both living and inanimate — that belongs to the patrimony of humanity and is destined also to future generations.”[33] Willingness to embrace secular critiques of life patents has come not only from Vatican diplomats but also from bishops in the global south, who witness the loss of biodiversity and sources of wealth creation resulting from the global patent regime.

Statements by national bishops conferences in Brazil and South Africa show concern about the potential dependence of southern countries on companies in the United States and Europe. A 2003 statement released by the Brazil conference's Pastoral Land Commission, headed by Bishops Tomás Balduino and Xavier Gille, recognizes as a great risk "the total dependency resulting from the destruction and finally disappearance of the small and even medium scale production and commercialization of seeds, which are subsumed under the domain of a small group of giant and powerful transnational corporations."[34] The statement makes explicit the connection between food sovereignty, local control of resources, and the common good. A statement by the South African conference's Justice and Peace desk also released in 2003 focuses on the loss of biodiversity: "Although biotechnology has the capacity to create a greater variety of commercial plants, the trend set by transnational corporations is to create broad international markets for a single product. This encourages genetic uniformity, thereby narrowing the genetic base of our food resources. Genetic uniformity leads to vulnerability."[35] The South African bishops reject the patenting of food outright, saying "[a]n animal, plant or micro-organism owes its creation ultimately to God, not to human endeavour."[36] The Maryknoll Office for Global Concerns also addressed patenting in 2003, expressing significant concerns about the threat of biopiracy.[37] Prelates and clergy in the global south have demonstrated an ability to frame secular concerns about biotechnologies in theological terms. These local documents leave to other bodies, however, the process of articulating a broad theological critique of the increasing ownership of the natural sphere.

The Roman Curia has called for the responsible use of IP in areas impacting fundamental rights. Archbishop Marchetto, in a 2000 address on biotechnology, recognized a conditional validity on the use of biotechnology to solve hunger issues, but placed as a foremost ethical concern the beneficiaries of increased agricultural production. If increased production comes at the expense of biodiversity and occurs only in developed countries, Marchetto suggests, such innovations are without ethical merit.[38] In solving global hunger, Marchetto concludes, biotechnologies "are neither singular, nor exclusive." Then-Monsignor John Patrick Foley, President of the Pontifical Council for Social Communications, argued in a 2003 address on the information society that IP rights have "the fundamental social task of serving the common good of the human family" and should therefore be subject to restraints outside market logic.[39] In specific applications, the Holy See has understood IP as restrained by notions of the common good which govern traditional markets and property relations. In the areas of health and hunger, the principle of the common good is particularly prescient.

More specifically, the curia argues a "social mortgage" applies to IP which requires that its use comes with specific responsibilities to the human community. The first clear application of the social mortgage principle to IP came in a 1999 address to the Jubilee 2000 debt campaign by Pope John Paul II. In the address, John Paul argues that agricultural biotechnology must submit itself to significant scientific and ethical examination: "[The Church] has consistently taught that there is a 'social mortgage' on all private property, a concept which today must also be applied to 'intellectual property' and to 'knowledge'. The law of profit alone cannot be applied to that which is essential for the fight against hunger, disease and poverty."[40] Since this first use, the Curia has applied the social mortgage principle to IP no less than seven times.[41] The Curia has developed its thought to argue that the creative impulse which drives intellectual creation belongs primarily to the human family,[42] that IP regimes constitute an exceptional monopoly that requires narrow legal interpretation,[43] and that privileged countries have a particular responsibility to ensure access to IP protected prescription drugs outside of their territories.[44]

While primary attention was focused in these statements on the availability of patented drugs in sub-Saharan Africa, they suggest in principle that the Holy See supports restrictions on IP where fundamental rights (alternatively, the rights to health or food) are at stake.

In recent years, the Holy See has recognized the clear connection between its advocacy on patented HIV-AIDS drugs and patented GMO foods. Renato Cardinal Martino, President of the Pontifical Council on Peace and Justice, was roundly criticized by McDonagh and others in 2002 when he told reporters with a laugh, “Look at me. I'm in good health ... I was in the United States for 16 years and I ate everything on the market, including a lot of GM food …Up to now, I've had no undesirable effects.”[45] Martino's position – anecdotal, dismissive, unrelated to patent issues, and based on the potentially false premise he was actually consuming GMO food[46] – was significantly revised by 2009. “If one wants to pursue GMOs” Martino told reporters, “one can freely do so, but without hiding that it's a way to make more profits.” Biotechnology, Martino now argues, requires great prudence so as to prevent abuse of the power to manipulate nature.[47] Martino's new-found reservations on biotechnology are also found in the Council's compendium: “one must avoid falling into the error of believing that only the spreading of the benefits connected with the new techniques of biotechnology can solve the urgent problems of poverty and underdevelopment that still afflict so many countries on the planet.”[48]

Two important academic works by Thomas Berg and Keith Douglass Warner have begun the process of linking secular intellectual property critiques with statements by the Curia and the broader Catholic social thought tradition. Berg, who focuses on IP and the preferential option for the poor, concludes that IP rights ought to be tailored where they affect “fundamental human necessities,” including food, water and the right to essential medicines.[49] Berg's approach includes government intervention where voluntary measures to enhance access fail.[50] Catholic social thought, Berg notes, insists that economic, social and legal analysis must extend beyond questions of production and efficiency to questions of distribution and empowerment of all; this is a “unique, but distinctive” perspective on IP.[51] Warner examines the connections between Catholic social thought and life patents, offering a comprehensive review of secular literature and with curial statements, and linking the Catholic notion of a “universal destination of goods” with the social mortgage principle. Distributive justice is the paradigm, Warner says, through which to view all private property, including IP. “The Catholic belief in the common good should be expressed in explicit support for the world’s germplasm as the common heritage of humankind.”[52] Berg and particularly Warner offer important insight which, like the Holy See, connects traditional Catholic teaching on private property to the emerging and complex field of intellectual property. Both authors recognize the centrality of the poor in Catholic social thought's economic prescriptions, continuing a conversation renewed by the Curia on the role of the common good in IP law.

Conclusion

This paper looks to build on the work of Berg and Warner by examining the ways in which life patents inhibit the vocation of farming, an essential element of Catholic social thought's “integral human development.” Berg and Warner's efforts, though pioneering in their exploration of Catholic social thought's “unique, but distinctive” position on IP, do not fully discuss the emerging anti-GMO movement and its critique of the seed patenting regime in particular. McDonagh's efforts, while rooted in the activist movement, do not rely on the intellectual platform of Catholic social thought to discuss limitations on property rights; as a result, McDonagh tends towards a non-pragmatic intellectual property abolitionism. In many ways, McDonagh's absolutism is as dangerous as the absolutist position taken by the members of the Pontifical Academy on Sciences: both run the risk of depriving indigenous communities,

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1 I. Potrykus, *Transgenic Plants for Food Security in the Context of Development*, (Vatican City: Pontifical Academy of Sciences, May 2009), http://www.vatican.va/roman_curia/pontifical_academies/acdscien/2008/booklet_transgenic_09.pdf , 4.

2 Ibid., 3.

3 Ibid.

4 John Allen, “Vatican studies genetically modified crops,” *National Catholic Reporter,* May 18, 2009, http://ncronline.org/news/ecology/vatican-studies-genetically-modified-crops.

5 Michael Mason, “How to Teach Science to the Pope,” *Discover Magazine*, August 18, 2008, http://discovermagazine.com/2008/sep/18-how-to-teach-science-to-the-pope/article_print.

6 Ibid.

7 Allen, “Vatican studies genetically modified crops.”

8 I. Potrykus, *Transgenic Plants for Food Security,* 4.

9 John Allen, “Resistance to GMOs works against the hungry and poor,” *National Catholic Reporter,* May 19, 2009, http://ncronline.org/news/ecology/resistance-gmos-works-against-hungry-and-poor.

10 John Allen, “Vatican study endorses GMOs for food security,” *National Catholic Reporter,* May 26, 2009, http://ncronline.org/news/ecology/vatican-study-endorses-gmos-food-security.

11 ETC Group, “Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life,” *Communiqué* 100 (November 2008), http://www.etcgroup.org/upload/publication/pdf_file/707, 5.

12 Edwin C. Hettinger, “Justifiying Intellectual Property,” in *Intellectual Property: Moral, Legal and International Dilemmas*, ed. Adam D. Moore (New York: Rowman and Littlefield Publishers, 1997), 30.

13 Ibid., 6.

14 Frederick Kaufman, “Let Them Eat Cash,” *Harper's Magazine*, June 2009, http://www.harpers.org/archive/2009/06/0082533.

15 Fred Kirschenmann, in discussion with the author, June 4, 2009.

16 Doug Gurian-Sherman, *Failure to Yield: Evaluating the Performance of Genetically Engineered Crops* (Cambridge, MA: Union of Concerned Scientists, April 2009), http://www.ucsusa.org/assets/documents/food_and_agriculture/failure-to-yield.pdf, 1.

17 Ibid., 2.

18 Ibid., 5.

19 ETC Group, “Who Owns Nature?” 9.

20 Vandana Shiva, “Special Report: Golden Rice and Neem: Biopatents and the Appropriation of Women's Environmental Knowledge,” *Women's Studies Quarterly* 29, no. 1/2 (Spring / Summer 2001): 15.

21 ETC Group, “Who Owns Nature?” 9.

22 Eran Binenbaum and others, “South-North Trade, Intellectual Property Jurisdictions, and Freedom to Operate in Agricultural Research on Staple Crops,” *Economic Development and Cultural Change* 51, no. 2 (January 2003), 309-10.

23 ETC Group, “Who Owns Nature?” 8.

24 Ibid., 11.

25 Ibid., 15.

26 Ibid., 28.

27 Sean McDonagh, “Will Biotech Agriculture Feed the World?” East Asian Pastoral Institute, http://eapi.admu.edu.ph/eapr006/mcdonagh.htm.

28 Sean McDonagh, *Patenting Life? Stop! Is Corporate Greed Forcing Us to Eat Genetically Engineered Food?* (Dublin: Dominican Publications, 2003)*,* 67.

29 Sean McDonagh, “Will Biotech Agriculture Feed the World?”

30 McDonagh, *Patenting Life? Stop!* 17.

31 Keith Douglass Warner, “Are Life Patents Ethical? Conflict Between Catholic Social Teaching and Agricultural Biotechnology's Patent Regime,” *Journal of Agricultural and Environmental Ethics* 14 (2001), 310-11.

32 Ibid., 302-3.

33 Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church* (Vatican City: Pontifical Council for Justice and Peace, 2006), http://www.vatican.va/roman_curia/pontifical_councils/justpeace/documents/rc_pc_justpeace_doc_20060526_compendio-dott-soc_en.html, 473, 477.

small farmers and the nations of the global south of the resources essential to their continued economic development. As Warner writes, "[f]rom a Catholic perspective, national patents should be guided by the same principles as the Church's teaching on conventional property rights, striking a balance between providing distributional justice and rewarding enterprise."[53] This paper intends to find that balance.

Notes

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34 Bishops accompanying the Pastoral Land Commissions of Brazil, *Opposition to the Use of GMOs* (Itaici, Brazil, May 6, 2003), http://www.maryknollogc.org/ecology/brazil.htm.

35 Southern African Catholic Bishops' Conference, *Genetically modified food: The impending disaster* (2003), http://www.maryknollogc.org/ecology/sacbc.htm.

36 Ibid.

37 Maryknoll Office for Global Concerns, "Reflection paper on Genetically Modified Organisms (GMOs)," (September 2003), http://www.maryknollogc.org/ecology/gmopaper.htm.

38 Agostino Marchetto, "Address to the Convention Organized by the Catholic University of the Sacred Heart on the Theme 'New Frontiers for Bioethics: The Biotechnologies,'"(address, Catholic University of the Sacred Heart, Rome, November 18, 2000), http://www.vatican.va/roman_curia/secretariat_state/documents/rc_seg-st_doc_20001118_marchetto-univ-sacred-heart_en.html

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III: Farming and Authentic Human Development

While Catholic social thought has said a great deal on the limits of traditional private property rights, its position on intellectual property rights (IPR) is less clear. However, a coherent Catholic position on IPR, and specifically on seed patents, can be constructed through an analysis of the Catholic position on private property in itself and, in this particular case, the teaching of recent popes on the nature of international development and globalization. The goal of any critique or reform of IPR should be, above all, that IPR are recast so that they come to respect the "nature of things … [and] above all, the human person."[1] The principle of authentic human development in Catholic social thought provides a critique with both religious and political implications, and defends the dignity of the human person by highlighting the integral roles of farmers and indigenous communities in their own development.

Theological arguments against life patents have traditionally focused on the morality of life ownership per se. Warner identifies two arguments in this vein. First, if God is the author and creator of life, no human being can create that life; patenting life, like patenting an invention, is claiming credit for that life and thus amounts to blasphemy.[2] Warner recognizes correctly that this objection has little social or political utility in a secular polity. Additionally, it is unclear whether lawmakers or the public connect the idea of patent rights to the idea of authorship: a purely legalistic perspective could argue that patent rights are merely the legal mechanism by which those who develop socially beneficial products reap just rewards for their investment. The second traditionally religious argument says that patent rights on life amount to an unwarranted extension of private ownership over that which belongs to all persons by virtue of its creation by God.[3] While this argument provides significantly more material for the political realm, taken by itself it remains vague. What constitutes an unwarranted extension of ownership, especially in the face of existential crises like global hunger, is an open question. The balancing act between economic interests and the common good in the Catholic theological tradition, Warner argues, is a stronger and better developed platform for discussing GMOs and life patents than the "playing God" argument.[4] The common good also provides a helpful mechanism for measuring what constitutes an unwarranted extension of private ownership. Where private ownership prevents development, which Paul VI defined as "social progress as well as economic growth,"[5] it should be restricted.

The Compendium of the Social Doctrine of the Church provides a means for assessing the moral legitimacy of all economic activity. "The free market cannot be judged apart from the ends that it seeks to accomplish and from the values that it transmits on a societal level." Indeed, the market does not legitimate itself but is legitimated by the just actions of individuals within it.[6] Justice towards the environment is among the values requiring respect. Individuals must not undermine an appropriate relationship between man and the environment, neither reducing nature "to a mere object to be manipulated and exploited" nor absolutizing nature and placing it "above the dignity of the human person himself."[7] Biodiversity "constitutes an extraordinary richness for all of humanity"[8] but is clearly limited; biotechnologists must therefore "respect the integrity and cycles of nature."[9] The Compendium's concern for biodiversity is not only environmental: the document also shows consideration for the world's indigenous peoples, for whom use of biodiversity is "a fundamental expression of their identity:"

> Due to powerful agro-industrial interests or the powerful processes of assimilation and urbanization, many of these peoples have already lost or risk losing the lands on which they live, lands tied to the very meaning of their existence. The rights of indigenous peoples must be appropriately protected. These peoples offer an example of a life lived in harmony with the environment that they have come to know well and to preserve. Their extraordinary experience, which is an irreplaceable resource for all humanity, runs the risk of being lost together with the environment from which they originate. [10]

Even when examining demanding problems, the Compendium calls for an approach which considers the impact of technological and legal developments over time and across cultures.

From this foundation, the Compendium gives specific attention to biotechnologies. While "human intervention in nature" is generally appropriate, it requires a strong sense of responsibility: "nature is not a sacred or divine reality that man must leave alone. Rather, it is a gift offered by the Creator to the human community, entrusted to the intelligence and moral responsibility of men and women."[11] The right to interfere with nature, therefore, presupposes a duty to do so under the guidance of conscience. Modern biotechnologies, the Compendium says "need to be evaluated according to the ethical criteria that must always guide human activities and relations in the social, economic and political spheres. Above all, the criteria of justice and solidarity must be taken into account." [12] The twin moral criteria of justice – "the constant and firm will to give their due to God and neighbour"[13] and solidarity – an attitude of "support, promotion, [and] development with respect to lower-order societies" which does not "restrict the existential space of the smaller essential cells of society"[14] – evaluate biotechnologies on their social impact, not on their level of technological development. Addressing global hunger is not chiefly a technological problem, then, but a political one: finding a solution which both respects what is due the individual and provides autonomy wherever possible to the individuals, communities and nations which are the subject of the proposed reforms. "[O]ne must avoid falling into the error of believing that only the spreading of the benefits connected with the new techniques of biotechnology can solve the urgent problems of poverty and underdevelopment that still afflict so many countries on the planet."[15] More recently, Benedict XVI has echoed this sentiment:

> Hunger is not so much dependent on lack of material things as on shortage of social resources, the most important of which are institutional ...The problem of food insecurity needs to be addressed within a long-term perspective, eliminating the structural causes that give rise to it and promoting the agricultural development of poorer countries.[16]

Crafting political solutions is the most important part of the reform process.

Authentic human development, a concept advanced primarily in Paul VI's 1967 encyclical *Populorum Progressio*, provides the best framework in Catholic social thought for evaluating biotechnology patenting in the context of the global hunger crisis. While other principles of Catholic social thought are relevant to genetic engineering, particularly those which regard the environmental impact of GE foods, authentic human development focuses on the nature of socially just international development. In so doing, it provides ethical limits on the property rights of goods connected to essential human rights, limits which, Chapters IV and V of this paper will argue, the current seed patent regime violates. The creation story in Genesis, Paul VI argues, teaches that "the whole of creation is for man, that he has been charged to give it meaning by his intelligent activity, to complete and perfect it by his own efforts and to his own advantage. "[17] Correspondingly, however, "if the earth truly was created to provide man with the necessities of life and the tools for his own progress, it follows that every man has the right to glean what he needs from the earth."[18] In order for development to be authentic, Paul VI writes, "it must be well rounded; it must foster the development of each man and of the whole man."[19] A "well-rounded" development (the phrase is frequently translated elsewhere as "integral") targets not countries or even communities but the rights, duties and vocations of individuals. As later thinkers, especially John Paul II, would explicate in greater detail, every individual human person has the right and duty to shape the world through use of her own personality and receive a livelihood as a direct result of her efforts. The role of development, the right to property, free trade and other legal protections are not, therefore, just to provide for the well-being of individual persons but to allow them the ability to secure their own well-being through meaningful labor. Legal protections should:

> reduce inequities, eliminate discrimination, free men from the bonds of servitude, and thus give them the capacity, in the sphere of temporal realities, to improve their lot, to further their moral growth and to develop their spiritual endowments … It is not enough to increase the general fund of wealth and then distribute it more fairly. It is not enough to develop technology so that the earth may become a more suitable living place for human beings ... Economics and technology are meaningless if they do not benefit man, for it is he they are to serve.[20]

Seed patenting must therefore not only be examined in relation to its object – the consumer of genetically modified food – but in relation to its subject – the farmer and farm communities responsible for producing that food. As a human occupation and anthropological reality, Catholic social thought considers farming in three important respects: as a human vocation, as a form of work, and as a form of development.

Farming as Human Vocation

Human beings are dependent upon the work of farmers, who cultivate and harvest the fruits of the earth necessary for their continued living. The centrality of farmers across societies throughout most of human history speaks to their essential role in the development of the human community. Because of its essential nature, farming can be spoken of in the Catholic tradition as a vocation. Vocations, the Compendium argues, are part of every person's plan to seek self-fulfillment. Through the development of one's abilities by education and personal effort, “the individual works his way toward the goal set for him by the Creator.”[21] The development of the farmer, however, is not only for the sake of those dependent upon her crop but for her own sake as well. As one works, the Second Vatican Council's *Gaudium et Spes* argues, “he develops himself … [h]e learns much, he cultivates his resources, he goes outside of himself and beyond himself ... A man is more precious for what he is than for what he has."[22] This development of self is not just for the economic benefit of either the producer or consumer, John Paul II notes, but for "concretely enhancing every individual's dignity and creativity, as well as his capacity to respond to his personal vocation, and thus to God's call."[23] While the farmer is not bound to traditional methods of production, he is bound to a "traditional" understanding of his role in the community and the tools required to achieve that role

The vocation of farming, as part of God's call to individuals, requires respect for farmers' work but also requires of farmers a respect for their own spiritual development. The end of agricultural production, *Gaudium et Spes* holds, is not a higher yield but the service of the full material intellectual, moral, spiritual and religious needs of "every man whatsoever and to every group of men, of every race and of every part of the world."[24] Because of the link between farming and the building up of human communities, it is not enough for those communities to consume food but to produce it. The process of producing food cultivates elements integral to human development besides the food itself: initiative, eagerness, and a feeling of interdependence among the persons in a community. If the primary agent of agricultural production is far away, in a distant culture, the community and its food-gatherers do not recognize the elements of the productive spirit in one another. John XXIII speaks eloquently of this vocation in 1961's *Mater et Magistra*, arguing that farming specifically is a vocation which activates God's providence and is undertaken to raise the farmer and his brethren to "a higher degree of civilization."[25] The community benefits developmentally when it produces the food which supports its own life and grows spiritually due to farming's connection to the divine:

> We are convinced that the farming community must take an active part in its own economic advancement, social progress and cultural betterment. Those who live on the land can hardly fail to appreciate the nobility of the work they are called upon to do. They

> are living in close harmony with Nature—the majestic temple of Creation. Their work has to do with the life of plants and animals, a life that is inexhaustible in its expression, inflexible in its laws, rich in allusions to God the Creator and Provider. They produce food for the support of human life, and the raw materials of industry in ever richer supply. Theirs is a work which carries with it a dignity all its own.[26]

As an essential vocation, farming plays a significant role in the legitimacy of an economic system. Farmers' rights not only protect the farmer, but they also protect a community's way of life.[27] If farmers lack the agency to carry out their vocation, they lack the ability to reap its spiritual rewards and their spiritual contribution to their community is lost.

Seed patents, Chapter V will argue, reduce the vocation of farming to an occupation by eliminating the agency that farmers have maintained throughout much of human history to control their methods of production. If the decision making power in the "farm community" excludes those directly responsible for growing crops, "development takes place over their heads."[28] Furthermore, the scale of farming which seed patents require for economic stability endangers the individual and family farms which are central to the farming vocation properly understood. As the U.S. bishops write in their 1986 pastoral letter *Economic Justice for All*, the temptation towards large farming enterprise, a temptation towards "individualism and greed," must be countered by a personally-driven solidarity in the farm community.[29] Understanding farming as a vocation requires that farmers remain in control of their own destiny.

Farming as Work

Catholic social thought uniquely privileges not only vocations, but human work in itself. Regardless of whether or not one is called by God to perform a certain occupation, performing that occupation affords the worker a unique right to the tools of her livelihood and the means to eventually achieve financial independence for herself and her family. "The obligation to earn one's bread by the sweat of one's brow also presumes the right to do so."[30] As participation in

"God's creative activity,"[31] participation in the economy affords by right an equal moral standing between laborer and employer. While the equality of economic agents originated in Leo XIII's seminal *Rerum Novarum*, which defended unionization and supported regulating working conditions, modern iterations of the argument emphasize the centrality of the human person over technology, and the connection between human labor and the Paschal mystery.

John Paul II's *Laborem Exercens* (1981) pioneered a modern Catholic understanding of the dignity of work by discussing work in uniquely spiritual terms. Human work, John Paul II argues, is "the essential key .. to the whole social question" because through work human persons are made more human.[32] Drawing on both science and revelation, the pontiff explicates an inter-disciplinary and cross-cultural argument that work "is a fundamental dimension of man's existence on earth."[33] As an essential element of man's existence, man is always work's proper subject and its chief concern.[34] Work is primarily an element of human dignity because it allows the worker to care for herself, her family and her society;[35] each person, regardless of their station in life, is afforded through work the ability to contribute to the institutions upon which they are dependent. Further, work provides an essential connection between a person and his natural history: he works in order to "increase the common good developed together with his compatriots … to add to the heritage of the whole human family."[36] Finally, work itself is an element of the Christian spiritual journey. "Sweat and toil … present the Christian and everyone who is called to follow Christ with the possibility of sharing lovingly in the work that Christ came to do … By enduring the toil of work in union with Christ crucified for us, man in a way collaborates with the Son of God for the redemption of humanity."[37] Poverty appears, therefore, where persons are underemployed or where their work is undervalued in the form of an unjust wage or insecure working conditions.[38] Still, John Paul II calls for a deeper form of respect for the laborer; work ought afford not only pay, but responsibility and creativity at the workplace.[39] Under harsh conditions or long working days, it is difficult to make the connection between one's efforts and the broader social, historical, familial and social goals one hopes to achieve for one's work. Key to the dignity of work, therefore, is not only that the opportunity to work in safety exist but also that the connection between that work and one's responsibility for others is self-evident.

A correctly ordered workplace provides opportunity for the most menial of laborers to accumulate long-term benefits – knowledge, respect, experience – which allow them to improve and better fulfill their vocation as irreplaceable parts of the human community. In the Catholic social thought tradition, the right to private property enshrined in the natural law presupposes equal access to that right by all classes of citizens.[40] An essential part of human freedom is the ability to express one's own personality and social function in the ownership of goods.[41] In particular, the U.S. bishops note, a wide distribution of property among small and family farms recognizes their value as among the most creative and effective economic drivers.[42] As Chapter IV notes, while seed patents allow farmers to sell the yield of their crops, patents presuppose that the crops themselves, as well as any new varieties that result by the farmer's intervention, are owned by the patent holder. Seed companies reserve the right to change the seed, and thus the knowledge underlying it, each season and prevent farmers from cultivating what they choose. Seed patents constitute a severing of the relationship, therefore, between work and its broader purposes. By provisioning ownership of seeds to those who claim them, not necessarily those who labor over them, seed patent rights position technology as the agent of work and devalue the contribution of individual farmers.

Farming as Development

Just as the principles of dignity of work and participation require respect for the autonomy of laborers, so too does the principle of subsidiarity require respect for the autonomy of the subjects of international development. Subsidiarity, which holds that the smallest social unit capable of performing a function effectively should perform that function, takes on a central role in the debate over global hunger, which has been traditionally dominated by countries outside the global south. Many critics perceive a similar disparity in trade negotiations between the developing and developed world. Paul VI argues that social justice requires the correction of such disparities, of both "overall situation and freedom of action."[43] Globalization, which has encouraged specialization between countries, has an effect on the level of agricultural protection in a country. As farming becomes a depressed occupation, John XXIII notes, the standard of living it provides decreases.[44] As the proportion of the world's farmers with significant human and social capital shifts in favor of the global north, the intellectual property regime for seeds is constructed to benefit northern agricultural interests.

The principle of subsidiarity argues that such a policy disparity, in which agricultural policies in the global north matter significantly more than those in the global south, centralizes wealth and cements income disparities. It is necessary, *Gaudium et Spes* holds, that "at every level the largest possible number of people and, when it is a question of international relations, all nations have an active share in directing that development. "[45] Policies established on the local level take into account the unique skills and abilities of laborers which, the document holds, are essential for true agricultural advance.[46] By developing policy on a global scale, globalization has instead imposed a highly technological form of farming on the developing world, one with which it has significantly less experience and skills. As Benedict XVI explains in *Caritas in Veritate*, subsidiarity respects all individuals and nations as capable of contributing to global production, even if their means of doing so are different from country to country. Subsidiarity takes account of the world's diversity and is therefore “particularly well-suited to managing globalization and directing it towards authentic human development.”[47] To impose agricultural policy on a country is to therefore eliminate the agency of its individuals and presume their contributions to the common good are of little merit.

Chapter IV will examine one type of social organization, indigenous communities, and conclude seed patents violate the principle of subsidiarity by imposing on these communities a property system in which they are incapable of participating. On the one hand, the global north maintains an “excessive zeal for protecting knowledge through an unduly rigid assertion of the right to intellectual property” for its native companies. [48] At the same time, indigenous communities are incapable of asserting intellectual property rights over the plants on which they have relied for thousands of years. In the vacuum, plants in the global south are overwhelmingly owned by patent holders in the global north, and the rights of indigenous communities to continue traditional practices are threatened. More generally, the patent regime's imbalances inhibit the ability of indigenous communities and farmers to build capital, thus endangering their long term economic development. As Benedict XVI argues, the involvement of local communities is critical when deciding whether and how to engage in technology transfer and development; technological development in itself does not relieve the global north of the responsibility to use technology with justice or explore equitable agrarian reform.[49] As the U.S. bishops write, “there is no substitute for long-term agricultural and food-system development in the nations now caught in the grip of hunger and starvation.”[50] These countries cannot rely on the charity of patent holders or international food aid to ensure their long term stability and development:

> It is not merely a matter of "giving from one's surplus", but of helping entire peoples which are presently excluded or marginalized to enter into the sphere of economic and human development. For this to happen, it is not enough to draw on the surplus goods which in fact our world abundantly produces; it requires above all a change of life-styles, of models of production and consumption, and of the established structures of power which today govern societies.[51]

Reforming the patent system is therefore not a matter of development but establishing the justice and equality which provides for true development.

Conclusion

The principle of "authentic human development" promulgated most notably by Paul VI protects three elements of farming: farming as vocation, farming as human work and farming as development. These principles do not undermine private property, but instead elevate it and provide a framework through which just property distribution is understood. Patents, like other forms of private property, should be governed by this test. As Warner writes, Catholic social though allows patenting so long as patents are consistent with the goals it establishes for all private property: that the hungry, ill and poor have a "social claim to access the benefits derived from knowledge and its development."[52] Particular scrutiny, *Caritas in Veritate* notes, is due modern technology, which threatens to remove the human element from enterprises like work which are necessarily designed for human persons. Using the language of technological advance, seed patenters and their defenders promise great material gains without considering whether their innovations empower the poor by giving them access to the tools of their own economic development. Chapters IV and V will examine the extent to which the status quo seed patent regime inhibits access to those benefits.

Notes

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34 Ibid., 5.
35 Ibid., 16.
36 Ibid., 10.
37 Ibid., 27.
38 Ibid., 8.
39 Ibid., 15.
40 John XXIII, *Mater et Magistra,* 113.
41 *Gaudium et Spes*, 71.
42 U.S. Catholic Bishops, *Economic Justice for All,* 114.
43 Paul VI, *Populorum Progressio*, 61.
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45 *Gaudium et Spes*, 65.
46 Ibid., 66.
47 Benedict XVI, *Caritas in Veritate*, 57.
48 Ibid., 22.
49 Ibid., 27.
50 U.S. Catholic Bishops, *Economic Justice for All,* 283.
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52 Warner, “Are Life Patents Ethical?” 313.

IV: Biopiracy and Community Development

The international seed patent regime systematically benefits corporations in the global north and harms the ability of local and indigenous communities to contribute to their own development. While 95% of the world's plant species grow below the equator, only a small minority of patents in the life sciences are held by companies from that region.[1] The international IPR regime protects the structure of institutions and norms prevalent in the global north; as a result, it has been implemented without substantial consideration of the need for human rights protections. By treating the traditional knowledge held by indigenous cultures as unowned, "intellectual property law made that knowledge available for unrestricted exploitation by outsiders."[2] Once held by outsiders, the economic benefit of that knowledge is rarely shared with the originating culture. This exploitation, termed biopiracy by opponents, has had a dramatic effect on the current and future ability of cultures to contribute to their own development. Because significant cultural blocks prevent indigenous communities from entering the system themselves, they are left entirely subject to the prerogatives of outside patent holders.

A Brief Overview of Patent Law

"A patent is an intellectual property right granted by state authority that excludes others from the use or benefit of a patented invention without the consent of the patentee."[3] Up until the 20th century, patents have been used exclusively to protect inventions of mechanical origin. 1930's Plant Protection Act in the United States is the first known law to allow the patenting of biological materials: it provides for the patenting of "unique plants discovered or invented in a cultivated state" which asexually reproduce.[4] In 1970, the Plant Variety Protection Act expanded the scope of patent protection to include "new, distinct, uniform and stable" varieties of plants that reproduce sexually.[5] Life patent jurisprudence in the United States has focused largely on the meaning of new, distinct, uniform and stable. Importantly, contemporary patent jurisprudence in the United States does not rest on moral premises.[6] When U.S. and European patent regulations were de facto adapted into the international trade regime, the laws came without moral premises on which to base international development policy.

Negotiated in 1994 by the WTO, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is the most comprehensive international instrument regulating intellectual property rights.[7] TRIPS deals with all forms of intellectual property, including copyright, trademarks, geographic indicators, industrial designs, and patents. Part II, Section 5, allows participating countries to grant patents for inventions which are new, involve an inventive step and have an industrial application.[8] Patents are granted in all fields of technology and do not discriminate with regard to the place of invention nor whether the invention is imported, as is often the case with seed patents. Member states can exclude plants, animals and essentially biological processes, but are not required to do so.[9] The qualified permission to exclude biological materials in Article 27.3b of TRIPS[10] allows national patent law to vary greatly even among countries which participate in international trade. The majority of countries in the agreement, however, have followed the U.S. and European approach, excluding only animal species and plant varieties from protection[11] while allowing protection for genetically engineered variations on plant species and the application of plant species to particular purposes. Since the 1980s, many developing countries have broadened patent protections to cover biological materials as such while developed countries have taken a much more restrictive approach: both are ultimately in keeping with the leniency prescribed in TRIPS.[12] Ultimately, the legal regime regarding patents on plant genetic resources (PGR) encompasses at least five international legal agreements and the laws of the United States and the European Union.[13] In the absence of firm international protections for the legal prerogatives of states in the global south, their laws become essentially irrelevant for purposes of international trade.

TRIPS was envisioned by the global north as a key legal instrument in the battle against international IPR infringement. Wary of counterfeit versions of inventions and entertainment products sold in the developing world, the U.S. and Europe sought to impose their own rigorous intellectual property regimes the world over.[14] In the hopes of increasing technology transfer from the developed world or the financial benefits of greater international trade,[15] the developing world conceded the developed world's demands on IPR. TRIPS requires substantial intellectual property protections by its member states and requires that each state treat foreign IP claims as equivalent to domestic claims.[16] Such a regime leads to a de facto transfer of the "ownership" of plant resources from the global south, where IP claims are difficult and few corporations or organizations are empowered to make those claims, to the global north, where IP law covers more and the vast majority of seed patenting industries are owned and operate.[17] As even proponents of the international patent regime concede, TRIPS is not an agreement primarily focused on human rights but one which carries significant human rights impacts.[18] The exportation of the U.S. / European patent system, which Bagley describes as patent first, ask questions later,[19] has significant impact on countries with wholly different legal traditions and cultural practices regarding property.

Biopiracy

Among opponents of the international patent regime, the systematic claiming of IPR by companies and organizations in the global north of PGR in the global south is known as "biopiracy." Indigenous cultures rely on an estimated 20,000 species of plants for medicinal and practical purposes.[20] The body of knowledge regarding the application of these plants, many native to the global south, has developed over hundreds of years and constitutes a largely uncommercialized repository of information in the world. Because TRIPS does not distinguish among types of intellectual property owners, and indigenous communities do not as a general rule treat their intellectual property as commercially valuable or even as property,[21] northern companies fill the vacuum, claiming patent rights on the traditional uses of plants and uses clearly derived from indigenous knowledge.

The patenting of the Indian neem tree is the best known example of biopiracy. While efforts to commercialize neem have been ongoing for the past seventy years, efforts to develop neem commercially in the West began much more recently, in the 1970s.[22] In 1990, the U.S. Department of Agriculture and the WR Grace Company applied for a patent on an anti-fungal product derived from neem which was awarded in 1994.[23] Though traditional cultures in India had used neem for the same purposes for approximately two thousand years, the patent in theory allowed WR Grace to file a patent infringement suit against any Indian using neem for healing purposes.[24] While a campaign by Vandana Shiva and the Research Foundation for Science, Technology and Natural Resource Policy successfully achieved repeal of the European patent in 2000,[25] a September 2002 search of the USPTO database listed some 400 patents using neem or its pesticidal agent;[26] a recent search reveals 347 patents which utilize neem for products as varied as pesticide, tooth-whitening chewing gum, pain relief and herbal dye.[27] The dramatic expansion of neem patents in the U.S. and Western Europe, Schuler argues, demonstrates that getting patents is too easy in the West and too difficult in India, which has had little luck commercializing neem.[28] The newness of any utilization of neem, and particularly of pesticidal uses, is drawn into question by evidence of indigenous use which long predates even the development of Western culture. As Shiva argues, “WR Grace's claim of novelty exists mainly in the context of the West's ignorance."[29]

The patent history of a South American grain known as quinoa shows similar disregard for traditional knowledge. In 1994, researchers at the University of Colorado received a patent on quinoa, despite its long history of utilization by Bolivian and Ecuadoran farmers.[30] Though the researchers later admitted they had "just picked [quinoa] up" on a trip to South America, consumption of the grain in the United States quickly grew to $1 billion a year. If enforced, Albright notes, the patent could prevent Bolivians from selling quinoa in their own country, and would dramatically cut quinoa exports from Bolivia and Ecuador to the United States. The University of Colorado relinquished its patent in 1998 to save itself international embarrassment;[31] however, a current U.S. patent search reveals some 274 patents on quinoa products, including 67 on quinoa cereal-related products.[32]

Not all of the far-sweeping patents on PGR have been withdrawn due to public pressure. In 1999, researcher Larry Proctor received a patent on a variety of yellow bean he called the Enola bean after a trip to Mexico. The far-reaching patent covered all beans of a yellow color from Mexico and methods of cross-breeding those beans which had been used by indigenous cultures.[33] Proctor mounted a series of lawsuits, including one against the Tutuli company, which had imported the beans to the U.S. from Mexico since 1994, causing the company significant financial hardship. In response to calls by the Mexican government to revoke the patent, Proctor threatened to flood the Mexican market with cheap beans, potentially destroying the livelihood of local farmers.[34] Proctor's company successfully yielded its patent rights against a Mexican cooperative exporting a similar crossbreed bean to the United States, causing the cooperative to lose a significant investment.[35] On May 2, 2008, the USPTO rejected Proctor's patent claims after a legal team led by the Consultative Group on International Agricultural Research produced significant documentation of previous scientific research on the yellow bean and similar varieties available in its gene bank.[36] However, the length of the legal process, along with Proctor's aggressive tactics, resulted in significant economic damage to Mexican farmers.

As with the Enola bean, the delay between the initial legal challenge to a domestic patent and action by USPTO is often substantial. A 1995 patent by two Indian scientists to use turmeric to treat wounds was overturned in 1997 after evidence surfaced of similar uses by Indian indigenous cultures;[37] some 638 patents currently exist on turmeric products[38] most of which, Schuler argues, apply to uses which have equally precedented indigenous origins. A South American vine used for Amazonian religious purposes, auahuasca, was patented by a U.S. pharmacologist from 1986-2000 despite the essential link between the plant and spiritual practices.[39] As bioethicist Leon Kass argues, the denial of individual patent applications is ultimately a poor method of making broad ethical decisions on the nature of property rights.[40] The revocation of patents after major damage has been done is even worse. The U.S. Patent Office, understaffed and overwhelmed with applications, is unable to respond to evidence of prior use in a timely manner.[41] In the absence of clear guidelines against particular kinds of patenting, a faith in technological process is instantiated without recognition of the effect patents have on the economic viability of indigenous communities.[42] Because the United States is the epicenter of biotechnology and the global seed market, TRIPS ultimately replicates the patent first, ask questions later model the world over.

Can the Global North Develop the Global South?

Proponents of patent rights frequently argue that patents are the only means of ensuring innovation. Communities in the global south facing hunger, disease and underdevelopment rely on agricultural and medicinal research in the global north, they assert, which is economically viable only if companies know they will reap the full benefit of their investment. This line of argument presumes either that indigenous and local cultures do not innovate for their own benefit or that the patent regime has no effect on the ability of local communities to develop themselves.

PGR research in the global north, which relies on the continued financial viability of the organizations or companies which undertake it, works against the interest of the local communities it presumes to serve. Patent proponents argue that the strict documentation requirements of patent law create a “patent and publish” regime which encourages scientific discourse even while it allows innovators to hold exclusive control over the profits of their inventions.[43] Unfortunately, PGR patent holders, particularly corporations, gain nearly exclusive control over particular plant varieties by patenting the whole plant or an entire type of application, as in the case of the Enola bean. In order to protect its profit potential, one patent holder becomes the exclusive agent of technological research on a plant, whether or not that research concerns itself with international development. Secrecy ultimately undermines the collaborative nature of research: the more corporations that enter the research process by obtaining patent rights, the greater the pressure applied to researchers to keep their findings secret and prevent competing or collaborating innovation.[44] An exclusively private research regime, Bienbaum and co-authors argue, cannot feed the world. “Even in developed countries, the now-dominant private-sector research efforts are concentrated on a small number of traits in crops with high commercial value.”[45] The primary purpose of many recent patents is to provide supplementary income for universities, researchers, and industries,[46] not to “break even” or protect legitimate and humanitarian forms of scientific research.

In order to maintain control over their own PGR, indigenous and local communities must rely on the charity of corporations and organizations in the global north. As many as 74% of plant-derived drugs patented in the north are used for the same purposes that native peoples used them for prior to the assertion of patent rights;[47] with ownership held elsewhere, the ability of native peoples to use their traditional knowledge is at best unclear. Even given this ownership, a rigorous culture of corporate social responsibility could potentially allow indigenous cultures to thrive on their PGR. Here, patent regime proponents again cite vitamin A enhanced rice. While the commercial rights for "GoldenRice" are owned by AstraZeneca, the company has licensed inventors to distribute the rice on a royalty-free basis to poor farmers in the global south.[48] The company's approval, however, is conditional: the farmers are given the seeds themselves, not the tools to improve the seeds or even the reassurance that they will have the right to replant the seeds in the next season. Without reassurances their long-term devotion to a particular crop will bear fruit, the incentive to develop an systematic body of agricultural knowledge is self-evidently low. In order to determine what exactly they can and cannot do with seeds, indigenous communities require "technical knowledge, a broad business overview, a detailed understanding of all relevant patent claims in all relevant countries, an understanding of markets and national jurisdictions, and a knowledge of litigation and negotiation procedures in relevant jurisdictions."[49] This steep barrier to entry prevents communities from developing themselves through continued and sustained investment in their indigenous knowledge.

Finally, cultural discrepancies between the global north and the global south prevent indigenous communities from participating in the patent regime themselves. Patent rights rely on the ability of the patent claimant to assert a novel and first use of a plant or the development of a plant variety through sufficient documentation. Where uses are traditional and passed down orally, documentation is inconsistent or nonexistent. Because the patent regime grants a comprehensive patent right to the particular use of a plant, any subsequent developments or "downstream" uses are restricted if the upstream use is under patent.[50] The abilities to control PGR and any subsequent uses of plants are ultimately contingent not on who used the plant first, but who is able to complete a patent application the fastest. The lack of patent applications from the developing world is not a matter of ignorance: Indian farmers were well aware of the commercial value of neem before it was patented.[51] Northern corporations are better able to capitalize the lack of patents on plant resources for five reasons. First, there are limited opportunities for indigenous communities to capitalize on patents locally. Second, there is a low level of investment in public research in the developing world. Third, weak capital markets in the developing world make raising money for investment difficult. Fourth, most indigenous cultures have little familiarity with Western patenting procedures.[52] Finally, patents are well outside the financial capabilities of many indigenous cultures: applications cost over $10,000 and associated litigation can cost $250,000 or more.[53] Without a clear development or human rights orientation in international law, the global south is subjected to an intellectual property regime in which it cannot participate and which is designed to benefit outside interests.

Conclusion

Prevented from participating in a patent system dominated by the global north and largely subject to its patent claims, the indigenous and local communities which form the backbone of social organization in the global south are denied their right to participation in their own development. By recognizing a right to participation, Catholic social thought recognizes the fundamental truth that international development cannot permanently rely on charity, no matter how well-intentioned. Only through "a massive investment in the human capacities of developing countries" is permanent development ensured; trade negotiations which do not focus on integral human development will fail to achieve the betterment of the common good.[54] The achievement of long-term self-sufficiency, both for indigenous communities and for local farmers individually, is therefore more than an aspiration; it is the true goal of all international development and global trade. Chapter V will discuss how the principles of participation and subsidiarity are infringed on the individual level, as farmers are permanently prevented from gaining access to the seeds which constitute the basic elements of their livelihood.

Notes

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1 Matthew Albright, *Profits Pending: How Life Patents Represent the Biggest Swindle of the 21st Century* (Monroe, Maine: Common Courage Press, 2004), 54.

2 Lawrence R. Helfer, "Human Rights and Intellectual Property: Conflict or Coexistence?" *Minnesota Intellectual Property Review* 47 (2003), http://mipr.umn.edu/archive/v5n1/Helfer.pdf, 52.

3 Jack Wilson, "Patenting Organisms: Intellectual Property Meets Biology," in *Who Owns Life?*, ed. David Magnus, Arthur Caplan and Glenn McGee (Amherst, New York: Prometheus Book, 2002), 26.

4 Ibid., 27.

5 Ibid., 36.

6 Ibid., 38.

7 Carlos M. Correa, *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options* (New York: Zed Books, 2000), 1.

8 Ibid., 17.

9 Ibid.

10 Ibid., 67.

11 Ibid.

12 Ibid., 52.

13 Kal Raustiala and David G Victor, "The Regime Complex for Plant Genetic Resources " *International Organization* 58, no. 2 (Spring, 2004): 279.

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15 Coenraad J. Visser, "Making Intellectual Property Laws Work for Traditional Knowledge," in *Poor People's Knowledge: Promoting Intellectual Property in Developing Countries*, ed J Michael Finger and Philip Schuler (Oxford: Oxford University Press & The World Bank. 2004), 209.

16 Anupam Chander and Madhavi Sunder , "The Romance of the Public Domain ," *California Law Review* 92, no. 5 (Oct. 2004), 1347.

17 Martin Teitel and Hope Shand, The Ownership of Life: When Patents and Values Clash (HKH Foundation, 1997), 11.

18 Jeanette Mwangi, "TRIPS and Agricultural Biotechnology: Implications for the Right to Food in Africa," in *Human Rights and Intellecual Property Rights: Tensions and Convergences,* ed. Mpazi Sinjela (Boston: Martinus Nijhoff Publishers, 2007), 254; Helfer, "Human Rights and Intellectual Property."

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21 Graham Dutfield, "The Public and Private Domains: Intellectual Property Rights in Traditional Knowledge, " *Science Communication* 21 (2000): 279.

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22 Philip Schuler, “Biopiracy and Commericalization of Ethnobotanical Knowledge,” in *Poor People's Knowledge: Promoting Intellectual Property in Developing Countries*, ed J Michael Finger and Philip Schuler (Oxford: Oxford University Press & The World Bank. 2004), 162-3.

23 Albright, *Profits Pending*, 42-3.

24 Ibid., 43.

25 Ibid., 43.

26 Schuler, “Biopiracy and Commericalization of Ethnobotanical Knowledge,” 161.

27 U.S. Patent and Trademark Office Database, http://patft.uspto.gov/ (accessed October 12, 2009).

28 Schuler, “Biopiracy and Commericalization of Ethnobotanical Knowledge,” 166.

29 Vandana Shiva, “Biopiracy: The Theft of Knowledge and Resources,” in Brian Tokar (ed), *Redesigning Life? The Worldwide Challenge to Genetic Engineering* (Ithaca, NY: McGill-Queen's University Press, 2001), 287.

30 Albright, *Profits Pending*, 47.

31 Ibid.

32 U.S. Patent and Trademark Office Database.

33 Albright, *Profits Pending*, 910.

34 Ibid.

35 David Magnus, “Intellectual Property and Agricultural Biotechnology: Bioprospecting or Biopiracy?” in *Who Owns Life?*, ed. David Magnus, Arthur Caplan and Glenn McGee (Amherst, New York: Prometheus Book, 2002), 269.

36 Consultative Group on International Agricultural Research, *U.S. Patent Office Rejects U.S. Company's Patent Protection for Bean Commonly Grown by Latin American Farmers* (May 2, 2008), http://www.ciat.cgiar.org/newsroom/enolabean2008.htm. Gene banking, discussed in Chapter VI, is a process by which non-governmental organizations attempt to document the plant varieties and traditional knowledge of indigenous peoples in order to win patent claims.

37 Schuler, “Biopiracy and Commericalization of Ethnobotanical Knowledge,” 167.

38 U.S. Patent and Trademark Office Database.

39 Schuler, “Biopiracy and Commericalization of Ethnobotanical Knowledge,” 169-70.

40 Leon Kass, *Towards a More Natural Science* (New York: The Free Press, 1998), 139.

41 Albright, *Profits Pending*, 910.

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43 Wilson, “Patenting Organisms,” 27.

44 Bryn Williams-Jones and Vural Ozdemir, “Enclosing the 'Knowledge Commons': Patenting Genes for Disease Risk and Drug Response at the University-Industry Interface,” in *Ethics and Law of Intellectual Property: Current Problems in Politics, Science and Technology*, ed. Christain Lenk, Niles Hoppe and Robert Andorno (Burlington, VT: Ashgate Publishing, 2007): 148.

45 Eran Binenbaum and others , “South-North Trade, Intellectual Property Jurisdictions, and Freedom to Operate in Agricultural Research on Staple Crops,” *Economic Development and Cultural Change* 51, no. 2 (Jan. 2003): 309-10.

46 Williams-Jones and Ozdemir, “Enclosing the 'Knowledge Commons,'” 138.

47 Schuler, “Biopiracy and Commericalization of Ethnobotanical Knowledge,” 160.

48 Binenbaum and others , “South-North Trade:” 316.

49 Ibid., 318.

50 Sabrina Safrin, “Hyperownership in a Time of Biotechnological Promise: The International Conflict to Control the Building Blocks of Life ,” *The American Journal of International Law* 98, no. 4 (Oct. 2004): 653.

51 Chander and Sunder , “The Romance of the Public Domain ,” 1353.

52 Ibid., 1351-2.

53 Kristin Dawkins, *Gene Wars: The Politics of Biotechnology* (New York: Seven Stories Press, 2003), 33.

54 Pontifical Council for Justice and Peace, *Some Reflections on the Occasion of the World Trade Organization “Millenium Round”* (Vatican City: Pontifical Council for Justice and Peace, November 18, 1999), http://www.vatican.va/roman_curia/pontifical_councils/justpeace/documents/rc_pc_justpeace_doc_19991118_trade-devel_en.html.

V: Seed Patents and the Family Farmer

Seed patents also significantly impact farmers on the individual level. In tandem with and under the protection of patents, genetically engineered seeds have increased costs for individual farmers while preventing them from engaging in seed trading and crop breeding which is a major source of food security throughout the world.[1] While genetically engineered traits have dramatically increased the cost of seed, they have not provided yields proportionate to their cost increases.[2] As applied in most countries, patent rights prohibit farmers from saving seeds from their own harvest, requiring them to renew a license or purchase new seeds each season.[3] By limiting the freedom of poor farmers, IPRs further impoverish them and reduce the incentive to grow all but "a narrow range of genetically uniform crops."[4] While often overlapping with Chapter IV's concerns about the impact of seed patents on local and indigenous communities, these concerns are unique for their impact on farmers as individuals and the principles of participation and the dignity of work.

Participation, Farmers' Rights and Food Sovereignty

The principle of participation in Catholic social thought argues that "basic justice demands the establishment of minimum levels of participation in the life of the human community for all persons."[5] The dignity of work, as articulated in *Laborem Exercens* and in Catholic teaching on unions, suggests participation is particularly important for individuals in their workplace and their industry. Alford and Naughton distinguish between participation – a sharing of a whole through distribution of the whole – and allocation – a sharing of a whole by division into parts.[6] It is not enough for persons to gain financially from their labors: they must also take part in certain common goods and collaborate in the exercise of certain rights. "To subdue the earth is to command its fruits not only for oneself, but also for others through increasingly comprehensive spheres of community."[7] An essential part of defending the dignity of the human person in the workplace is protecting the exercise of her creativity: where workers feel insecure in their workplaces, they waste resources and become passive. "Human costs always include economic costs, and economic dysfunctions always involve human costs."[8] An equality of condition between farmers and those who use their products, both in wealth and in political or social power, is therefore a fundamental aspect of distributive justice.[9] The third world farmer, who supplies germplasm to corporate agriculture and consumes its technological and industrial products, is left completely unable to compete with that industry by the patent regime.[10] The right of farmers to control the seeds they plant, known in the literature as "farmers' rights," is not addressed by TRIPS and is as a result subject to the will of individual nations.[11] Unlike many human rights in the 21st century, there is no internationally-recognized norm for the treatment of farm workers.

The vast majority of the world's farmers, who farm on a subsistence basis, lose to seed patents not only their rights of participation as farmers, but also their right to participate as consumers of food. Food sovereignty, "the right of peoples to define their own ... agriculture" and the extent of their reliance on external source of food,[12] is inhibited where seed companies control what crops farmers can grow and the amount of time they are allowed by license to grow those crops. Without affirmative support in the form of national and international policies, the world's hungry and malnourished, most of whom are subsistence farmers or landless farm workers, cannot compete with "increasingly subsidized industrialized agriculture."[13] Contemporary development policies have exacerbated power disparities by imposing crop choices on third world farmers. The Gates Foundation, a prominent anti-poverty NGO with considerable resources, views a combination of cash crops and market access as the pathway out of poverty. As a result of the Foundation's investment strategies and agenda-setting, nearly a quarter of African countries depend on a single commodity for a majority of their export income, prices which are often volatile.[14] Since 1995, Africa has seen twice as many new acres of cotton as new acres of corn, and 50 percent more new acres of cocoa beans than of millet.[15] Where farmers invest greater percentages of their resources in exports, they lose land on which they could produce food for themselves and depend increasingly on foreign imports for basic sustenance. Against this backdrop, patented and genetically engineered crops force individual farmers to accept the negative consequences of corporate decision-making.

The Proliferation of Genetically Engineered Patented Food Crops

As less and less of the developing world's agriculture land grows food, a greater percentage of that food is grown with genetically engineered seeds. Endowed with seemingly beneficial genetic modifications, seed companies persuade individual farmers to unwittingly relinquish rights essential to their dignity in exchange for yields which never materialize. With potentially damaging environmental consequences in their own right, genetic modifications serve as the appealing packaging through which patent-controlled seeds are sold to subsistence and other poor farmers.

Once concentrated in the free exchange of seeds among farmers, the global seed market is increasingly controlled by corporations due to patenting. While the global seed market grew by 11% from 1996 to 2006, the percentage of commercially traded seeds doubled, indicating a significant drop in the reuse and free exchange of seeds.[16] The commercial seed market is increasingly centralized. Three companies – Dupont, Monsanto and Novartis – control 20% of the global seed trade.[17] Expanding that group to include AstraZeneca and Aventis, 23% of the seed market, 60% of the pesticide market and nearly all of the market in transgenic seeds is controlled by the same five companies.[18] Genetic engineering is a tool used by seed firms to increase the profitability of their products. Estimates for 2009 suggest 75% of the corn seeds in the United States are triple-stacked, meaning they include three or more significant genetic modifications.[19] Since revenue is higher for these crops, companies have no commercial interest in producing others, regardless of farmer need.[20] In this way, IP protections allow companies to control entire markets, not merely ideas.[21] Once a company patents a basic genetic modification, like resistance to a pesticide, it can engineer that modification in to a large group of plant species, giving the company the ability to systematically privatize a series of crops essential for food production.[22]

By altering the demands of consumers, genetically engineered crops fundamentally change seed production to favor patented traits. Because patented seeds produce greater profit for manufacturers, research and development on seeds has shifted from academia into the private sector.[23] Genetic engineering has likely brought farmers irreversible new benefits, such as reduced erosion, pesticide and fuel use.[24] However, these benefits also tilt market power towards the innovator: as technology innovation drives costs down, seed prices continue to increase.[25] Patent control allows seed companies to price the most up-to-date traits far above market equilibrium. As food customers demand larger and larger yields for their money, seed companies without new patented traits are less able to compete with the company which developed those traits. This system of control, Moss argues, has led to the compete consolidation of the seed industry; one company, Monsanto, now controls 95% of the market in desirable corn traits and 97% of the market in desirable soybean traits.[26] While Monsanto may license these traits to other firms, “bundling agreements” included with the license allow Monsanto to penalize firms which do not convert a minimum percentage of their entire product line to genetically engineered seeds which include Monsanto traits.[27] Because Monsanto packaged a series of highly successful genetic traits in a set of patented varieties, it increasingly dictated the crop varieties which would bring farmers success at market. Prior to genetic engineering, a large field of companies could compete to produce a particular crop. Now, as GE crops drive down price expectations for food consumers, companies are forced to compete to produce particular traits instead of particular crops: unlike crops, traits come with high research costs and, due to patenting, are never shared between firms. The firm able to generate the trait first wins, closing other firms completely out of the market and dramatically reducing the number of choices available to farmers.

Genetically engineered crops can infringe farmers' rights even if they choose not to plant them. While the biotechnology industry has repeatedly claimed that genetically engineered crops could be controlled, they are ultimately living organisms which behave in unpredictable ways.[28] Starlink, a variety of GE corn which the FDA deemed unfit for human consumption, was found in the human food supply within a month of its planting in 2000.[29] In southern Mexico, traditional varieties of maize quickly cross-contaminated with GE varieties after their initial introduction in 2001.[30] Levels of contamination by GE crops can go as high as one percent. Even if contamination only takes place in 0.1% of food seeds, that amounts to 25,000 fifty pound bags of crop or 24 tractor trailers of seed,[31] imposing themselves on perhaps hundreds of farmers.

The control exercised by global agricultural firms endangers a form of farmer autonomy which is essential to the financial viability of small farmers: the saving, breeding, trading, selling and replanting of seeds. In most industries, capital lasts more than one season. By adding his labor to existing capital, the laborer grows his capital, expands his business, exercises control over his livelihood and eventually achieves independence. Genetic modification has allowed seed owners to claim patent rights over seeds, thus exercising a continuing control over the primary form of farming capital: the seed. As genetically modified crops continue to overtake non-modified crops in the marketplace, they also displace an entire form of small farming. While engineered seeds do not dramatically increase yields, they preference “large-scale intensive monoculture production” over subsistence farming, require expensive inputs like pesticides and herbicides, and due to patent control must be repurchased each season.[32] As more genetic modifications drive up the price of seeds, GE seeds often become too expensive for individuals to purchase.[33] Where farmers lose the financial ability to farm for themselves, they also lose the ability to control the fruit of their labors and direct the well-being of their families.

Monsanto has been among the most notable companies attempting to control seed reuse. In Mexico, Monsanto recently took out newspaper advertisements threatening jail time and hefty fines to peasants who reuse seeds.[34] In the United States, a 1994 law prevents farmers from saving or selling seeds protected by patents.[35] Seed companies are using North America as a legal test ground to generate patent case law. Monsanto has accused individual farmers in the United States of patent infringement in over 100 cases.[36] In perhaps the most famous case, Canadian canola farmer Percy Schmeiser was sued by Monsanto for use of patented seeds when those seeds blew onto his land.[37] As Dawkins notes, this precedent would have declared that infringement was not dependent on the action – or inaction – of the accused party.[38] While the case was settled in Schmeiser's favor in 2008, lawsuits against individual farmers are again a poor way of establishing policy: legal challenges are costly for individuals, and the fierceness of litigation can dissuade many farmers from sharing or replanting seeds in the first place.

As farmers are less and less capable of engineering their own crop varieties through natural means, farmers around the world plant more and more of the world's food supply using fewer and fewer crops, most genetically engineered and owned by a handful of firms. The most planted crop in the world today is Monsanto's Roundup-Ready soybeans.[39] The seed, which debuted in 1996 and is genetically engineered to tolerate high levels of the company's Roundup pesticide, comes with continuing costs. Farmers who use Roundup-Ready soybeans sign a “gene licensing agreement” each year barring them from saving, reselling or supplying seeds to other farmers for any reason.[40] As Teitel and Shand argue, this reverses the traditional relationship between farmers and agricultural firms: farmers no longer supply germplasm but rent it from firms.[41] Most importantly, Monsanto uses often coercive pressure to outlaw the practices which make small-scale farming economically stable. The increasing corporatization of farming is not just the loss of an idyllic notion of rural life, but an encroachment on the right of individual farmers to reap just fruits from their labors and control their level of autonomy.

Genetic engineering allows seed patent holders to maintain control of seeds through technical as well as legal means. Genetic Use Restriction Technology (GURTs) uses genetically engineered genes “in combination with an environmental or chemical inducer … to switch on or off the expression of a plant’s genetic traits. In the case of varietal GURTs, or V-GURTs, the reproductive viability of the entire plant is under the control of the company/institution that sells the seed.”[42] Derisively called “terminator seeds,” V-GURTs threaten to completely circumvent both law and tradition by preventing plants from reproducing and forcing farmers to buy new seeds each year.[43] Promoted as an environmentally-friendly way to prevent the outgrowth of GE seeds into nature or onto other fields,[44] research into V-GURTs is expanding, with funding from governments in the United States and Europe.[45] If the outgrowth problem is not resolved, however, V-GURTs could transmit their sterility to non-engineered plants through normal pollination,[46] threatening to eliminate the reproductive capacity of whole regions of food crops. By acknowledging the threat of GE crop outgrowth and ensuring the latest genetic traits are only available on sterile platforms, seed companies could promote and governments could require V-GURTs as "safer, more responsible seed technology."[47] While public pressure initially forced Monsanto to promise not to commercialize sterile seeds,[48] the company has since been purchased by Pharmacia, a company which did not make this pledge. By 2001, four of the five largest seed companies had patents on sterile seeds.[49] As McDonagh argues, V-GURTs illustrate that seed companies have no real interest in unconditional technology transfer to the developing world.[50] If implemented into just a handful of agricultural products, sterile seeds could ensure that subsistence farmers are absolutely dependent on seed companies to supply seeds annually and to supply the chemical products necessary to "turn fertility on." This absolute loss of autonomy would come independent of law: even if legal reforms allow farmers in the developing world to save and reuse seeds in the years ahead, the crops themselves will not allow reuse.

Conclusion

Seed patenting provides patent owners the ability to restrict or even technologically prohibit seed saving, reuse, sale and replanting, a set of practices essential to the economic sustainability of small-scale and subsistence farming, especially in the developing world. Such prohibitions violate farmers' rights – the right of farmers to control what they plant and how they plant it – and food sovereignty – the right of individuals to control where their food comes from and, ultimately, the right of those individuals to grow their own food if they choose. In its 1999 document, the Pontifical Council for Justice and Peace recognized the role small farmers play in biodiversity:

> Many actors (smallholder farmers, herders, artisanal fisherfolk) play a central role in preserving and enhancing agro-biodiversity through the nurturing of plant and crop varieties specifically suited to diverse local environments. In recent times, biotechnological research carried out by biochemical and agrobusiness in developed countries has developed new genetically modified seeds and plant varieties using in part

the traditional knowledge of local communities and the biodiversity of the South. A

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2 Christopher Then and Ruth Tippe, *The Future of Seeds and Food under the Growing Threat of Patents and Market Concentration* (April 2009: The International Coalition of No Patents on Seeds), http://www.no-patents-on-seeds.org/images/documents/report_future_of_seed_en.pdf, 8.

3 Ibid., 4.

4 Graham Dutfield, “Intellectual Property, Biological Resources and Traditional Knowledge,” in *Intellectual Property and Information Wealth: Issues and Practices in the Digital Age*, ed. Peter K Yu (Westport, CT: Praeger, 2007), 4:322.

5 U.S. Catholic Bishops, *Economic Justice for All,* 77.

6 Helen J Alford and Michael J Naughton, *Managing as if Faith Mattered* (Notre Dame, IN: University of Notre Dame Press, 2001), 50-1.

7 Ibid., 162.

8 Benedict XVI, *Encyclical Letter Caritas in Veritate of the Supreme Pontiff Benedict XVI to the Bishops, Priests and Deacons, Men and Women Religious, the Lay Faithful and All People of Good Will on Integral Human Development in Charity and Truth* (Vatican City, June 29, 2009), http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html, sec. 32.

9 *John XXIII, Mater et Magistra: Encyclical of Pope John XXIII on Christianity and Social Progress* (Vatican City, May 15, 1961), http://www.vatican.va/holy_father/john_xxiii/encyclicals/documents/hf_j-xxiii_enc_15051961_mater_en.html, sec. 125.

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11 Dutfield, “Intellectual Property,” 326.

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13 Ibid., 9.

14 Anuradha Mittal, “Introduction,” in *Voices from Africa African Farmers and Environmentalists Speak Out Against a New Green Revolution in Africa* , ed. Anuradha Mittal with Melissa Moore (Oakland Institute: 2006), http://www.oaklandinstitute.org/voicesfromafrica/pdfs/voicesfromafrica_full.pdf, 6.

15 Ibid.

16 Then and Tippe, *The Future of Seeds*, 7.

17 Hope Shand, “Gene Giants: Understanding the 'Life Industry,'” in *Redesigning Life? The Worldwide Challenge to Genetic Engineering*, ed. Brian Tokar (Ithaca, NY: McGill-Queen's University Press, 2001), 230.

18 Ibid., 231.

19 Then and Tippe, *The Future of Seeds*, 10.

20 Ibid., 11.

21 Shand, “Gene Giants,” 226.

22 Then and Tippe, *The Future of Seeds*, 23.

23 Diana L Moss, *Transgenic Seed Platforms: Competition Between a Rock and a Hard Place?* (Washington, DC: American Antitrust Institute, October 23, 2009), http://www.antitrustinstitute.org/archives/files/AAI_Platforms%20and%20Transgenic%20Seed_102320091053.pdf, 7.

24 Ibid., 9.

25 Ibid.

26 Ibid., 13.

27 Ibid., 24.

28 Carmelo Ruiz-Marrero, *Biotech Crops and Foods: The Risks and Alternatives* (Oakland Institute: April 2006), http://www.oaklandinstitute.org/RTC2006/BIOTECH_CROPS_AND_FOODS.pdf, 4.

29 Ibid.

30 Ibid., 5.

31 Ibid., 6.

> tendency to restrict the flows of this knowledge through legal protection has followed. As a result, the price of patented seed compared to other seeds has increased, as has the dependency of farmers on private firms. This trend is now affecting other inputs, such as pesticides and fertilizers … Patents on plant varieties may also have significant impacts on the preservation of biodiversity, as patented varieties have the tendency to displace local varieties and to foster monocultures..[51]

The principle of participation in Catholic social thought suggests that the dependency of small farmers on agribusiness fundamentally infringes on the rights of individuals to autonomous work which, over time, provides the opportunity to achieve greater wealth and economic independence. Chapter VI will return to Paul VI's notion of "authentic human development," examining proposed policy solutions to the problems posed in Chapter IV and this chapter and evaluating those proposals on their ability to defend the dignity of work, increase participation, and promote development based on the principle of subsidiarity.

Notes

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[33] Richard Stallman, "Biopiracy or Bioprivateering?" in *Information Ethics: Privacy, Property and Power*, ed. Adam D Moore (Seattle: University of Washington Press, 2005), 169.

[34] Ruiz-Marrero, *Biotech Crops and Foods*, 9.

[35] Ibid., 50.

[36] Then and Tippe, *The Future of Seeds*, 9.

[37] Albright, *Profits Pending*, 50-1.

[38] Kristin Dawkins, *Gene Wars: The Politics of Biotechnology* (New York: Seven Stories Press, 2003), 36.

[39] Martha L. Crouch, "From Golden Rice to Terminator Technology: Agricultural Biotechnology Will Not Feed the World or Save the Environment," in *Redesigning Life? The Worldwide Challenge to Genetic Engineering*, ed. Brian Tokar (Ithaca, NY: McGill-Queen's University Press, 2001), 27.

[40] Martin Teitel and Hope Shand, *The Ownership of Life: When Patents and Values Clash* (HKH Foundation, 1997), 27.

[41] Ibid., 28.

[42] ETC Group, "Terminator: The Sequel," *Communiqué* 95 (May / June 2007), http://www.etcgroup.org/upload/publication/pdf_file/635, 3.

[43] Albright, *Profits Pending*, 135.

[44] Crouch, "From Golden Rice to Terminator Technology," 33.

[45] ETC Group, "Terminator: The Sequel," 3.

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[46] Ibid., 8.
[47] Ibid., 10.
[48] Albright, *Profits Pending*, 136.
[49] Ibid., 136.
[50] Sean McDonagh, *Patenting Life? Stop! Is Corporate Greed Forcing Us to Eat Genetically Engineered Food?* (Dublin: Dominican Publications, 2003), 88.
[51] Pontifical Council for Justice and Peace*, Some Reflections on the Occasion of the World Trade Organization "Millenium Round"* (Vatican City: Pontifical Council for Justice and Peace, November 18, 1999), http://www.vatican.va/roman_curia/pontifical_councils/justpeace/documents/rc_pc_justpeace_doc_19991118_trade-devel_en.html.

VI: Policy Alternatives and Reforms

A variety of policy reforms – human rights accords, national policies and individual agreements between agricultural firms and local communities – have proposed to resolve the unique problems associated with seed patents without drawing into question the patent system per se. Critique directed at intellectual property protection in itself is both beyond the scope of this paper and necessarily in tension with its conclusions; a system of complete intellectual property anarchy imposed on the developing world and on indigenous communities is as damaging as authoritarian intellectual property controls which prevent individual farmers from exercising their freedom to control seeds. In order to address the concerns of both Chapters IV and V, therefore, policy reforms must simultaneously protect the ability of originating breeders – particularly indigenous communities – to make use of their resources and the rights of subsistence farmers to food sovereignty. No one policy can in itself solve both problems:

> Development will never be fully guaranteed through automatic or impersonal forces, whether they derive from the market or from international politics. Development is impossible without upright men and women, without financiers and politicians whose consciences are finely attuned to the requirements of the common good. Both professional competence and moral consistency are necessary. [1]

Under Catholic social thought, policy design cannot look to any individual's profit but should balance the rights and duties of each player in the policy implementation process: in other words, policy must seek the common good.

In its reflection on biotechnology, the Pontifical Council of Justice and Peace has provided some broad goals for policies surrounding seeds. First, the Council argues, “equitable commercial exchange, without the burden of unjust stipulations, is to be facilitated.”[2] At the same time, however, development is not achieved through the exchange of products exclusively but through the achievement of “a necessary scientific and technological autonomy” through the exchange of knowledge and the transfer of technology.[3] Human rights agreements are frequently perceived as abstract statements of principle subject to limited enforcement. The Council's guidance suggests human right agreements should bind policymakers as much as trade agreements. Authority is not wholly in the international realm, however:

> Solidarity also means appealing to the responsibility of developing countries, and in particular of their political leaders, for promoting trade policies that are favourable to their peoples and the exchange of technology that can improve the conditions of their food supply and health. In such countries, there must be an increase in research investment, with special attention to the particular characteristics and needs of their territory and population, above all by bearing in mind that some research in the area of biotechnology, which may be potentially beneficial, requires relatively modest investments. To this end it would be useful to establish national agencies responsible for protecting the common good by means of careful risk management.[4]

The Council recognizes that *sui generis* legal systems like those allowed in TRIPS and individual instances of technology transfer may achieve the above goals.[5] While developed and developing countries must agree on the same ends for an international seed patent regime, they should have the authority to choose their own means to achieve those ends. For developed countries, this requires the ability to judge other countries' policy regimes on their goals, not on their similarity to their own established laws.

Human Rights Agreements

Since the 1970s, groups of countries have sought human rights agreements which, while preserving policy sovereignty, suggest criteria on which policies should be formed and judged. 1992's Convention on Biological Diversity is primarily focused on international cooperation and aims to facilitate “sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources.”[6] The treaty's 191 parties are required to “take legislative, administrative or policy measures, as appropriate, to provide for the effective participation in biotechnological research activities by [all the treaty's parties], especially developing countries."[7] This requires that signatories provide "priority access" to benefits arising from research to the countries which provide genetic resources.[8] While the parties agree to cooperate in the creation of international regulations,[9] policy creation is left to the parties individually. In 2002, the members agreed to the Bonn Guidelines, a set of guiding principles to facilitate implementation. These guidelines ultimately rule that the involvement of individual stakeholders changes on a case-by-case basis.[10] The agreement requires rules which allow indigenous communities to share the profits of biotechnologies and continue to utilize their traditional knowledge (known as "access and benefit sharing" provisions)[11] and requires that indigenous communities maintain ultimate control over whether traditional knowledge will be commercialized ("prior informed consent.")[12] The United States and the Holy See are among four U.N. member countries which have not ratified the convention.

A pair of agreements by the Food and Agriculture Organization have sought to loosen IP restrictions for seeds. 1983's International Undertaking on Plant Genetic Resources described plant genetic resources (PGR) as "a heritage of mankind [which] consequently should be available without restriction."[13] The treaty made samples of PGR available for access and export where they are requested for research, breeding or conservation at no cost under mutually-agreed-upon terms.[14] The treaty also required developed countries to strengthen international cooperation in order to better enable use of PGR in the developing world.[15] The International Treaty on Plant Genetic Resources, implemented in 2001, supplants the 1983 agreement. It recognizes a broader right "to save, use, exchange and sell farm-saved seed and other propagating material," for farmers to participate in decision-making and for breeders to receive access and benefit sharing rights. The responsibility for respecting these rights, it says, rests with national governments, who are to promote collection of PGR and support the individual efforts of farmers to save seeds. [16] The treaty seeks, in vague terms, to strike the balance called for between the individual right to save and reuse seeds and the collective right to receive just compensation for traditional knowledge and breeding. While 119 countries and the European Union are full parties to the treaty, the United States is among a large group of nations which have signed the treaty but are not yet members. As a non-member of the FAO, the Holy See cannot become a party to the treaty.

The Union for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization created to support the protection of IPR for plants. UPOV was established by convention in 1961; the most recent revisions of the convention occurred in 1978 and 1991. The 1978 convention allowed member states to recognize IP on plants, but patents could only span one species[17] for the purposes of sales and marketing only.[18] In addition, the convention required that patents be granted only for inventions which were demonstrated to be new, distinct, genetically uniform, and stable within the species. The 1991 convention preserves and better defines these four requirements.[19] Additionally, however, it requires the consent of breeders for patent holders to engage in the sale, marketing, promotion, export, import or stocking of PGR. These requirements are not extended to private, experimental or breeding purposes, exceptions similar to the public domain for copyright law. The 1991 convention also expands the term of rights and allows countries sovereignty on the question of seed resale.[20] The United States and the European Union are among 68 parties to the UPOV Convention. While the Holy See has joined the World Intellectual Property Organization, it has not joined UPOV.

Advocates for indigenous communities strongly criticize UPOV for taking no positive action to ensure access to seeds. Sahai argues a non-UPOV treaty on IPR should provide reliable, good quality seeds to small and large farmers while seeking to strongly defend biodiversity through local control.[21] Developing countries have also suggested a desire for stronger rights protections. In 1993, seven indigenous tribes from New Zealand signed the Mataatua Declaration, which declared a right to expand and control the marketing of traditional knowledge as part of a broader right of indigenous self-determination.[22] In 2007, 500 representatives of 80 countries formed the Declaration of Nylenti, which declares a universal right to food sovereignty.[23] Both frameworks call attention to the degree to which the conceptualization of human rights occurs much faster than the adoption of human rights accords. Notably, only the IUPGR has been significantly revised in the last 15 years.

Among the international treaties, IUPGR is unique for its simultaneous acknowledgment of farmers' and breeders' rights. By focusing on both rights and the ends of policies used to achieve those rights, IUPGR asserts that development must ultimately respect both. Within its framework, countries have the space to innovate and promote additional rights. The Constitution of Ecuador, ratified in 2008, protects sustainable agriculture, bans GE crops except when they are approved by the President and National Assembly,[24] and defines food sovereignty as “an objective and strategic obligation from the State to guarantee its people, communities, pueblos and nationalities self sufficiency in healthy food, culturally appropriate in a permanent form.”[25] Achieving IUPGR's goals requires that states around the world balance their rights with their duties. All members of TRIPS, particularly the United States, should join IUPGR or a similar treaty framework in recognition of their duty both to apply intellectual property protections to foreign parties and allow reasonable exceptions to domestic IP claims where necessary to protect food sovereignty or farmers' rights. In an international system, true innovation can occur only where broad international consensus exists.

Policy Innovation – Farmers' Rights

Laws and institutions can both play roles re-enabling seed sharing and reuse by local farmers. A comprehensive law passed by the government of India in 2001, the Protection of Plant Varieties and Farmers' Rights Act, gives farmers the right “to save, use, sow, re-sow, exchange, share and sell farm produce, including seeds of varieties protected by plant breeders' rights,” so long as the farmers are not reselling the seeds as branded packages.[26] Beyond rights protections, it also better enables seed saving by an exacting definition of patentable material: it repeats the new, distinct, uniform and stable requirements of UPOV with the addition of an exception for plants and traditional knowledge which are of religious significance.[27] The act also defends farmers' rights through the establishment of a plant registry, which can make patent ownership more clear, and a provision which obliges seed companies to disclose the performance of their genetically engineered breeds. In lieu of strong laws, formal and informal institutions can enable local seed markets. The Basque Seed Network in Spain, founded in 2001, has over 80 voluntary members. As part of its activities, it publishes a manual on how to save seeds and a seed catalog for local farmers, facilitates local seed markets and encourages the use of local seeds.[28] As the Farmers' Rights Project argues, these projects reflect the notion of a collective right available to all farmers.[29] Strengthening local seed markets enables participation over allocation by enlarging the resources available to all farmers in the community: where a local seed market includes 40 varieties of non-patented seeds instead of ten, the farmer who shops there has much greater autonomy to decide what to plant and how to plant it. However, national laws provide what institutions cannot by requiring the full information disclosure which can inform the activities of all farmers. Information about what farmers are planting is essential to their participation.

Jack Kloppenburg, a professor of sociology at the University of Wisconsin, proposes an alternative means of defending farmers' rights: an “open source biology” movement which mandates seed sharing. The seed, Kloppenburg argues, has become a symbol of the struggle of indigenous culture against the logic of the market.[30] The innovation in indigenous culture operates in a decentralized way, Kloppenburg argues, which inherently precludes new developments from traditional ownership.[31] Kloppenburg proposes to substitute open source mechanisms for patent protections. Begun in the 1980s, the open source software movement allows computer software developers to freely distribute their code under the condition that modifications to that code are also freely distributed. Companies and individuals who contribute to open source software – for example, the Firefox internet browser and Linux operating system – give permission for their code to be modified by others without exercising control over those future modifications. When sharing is the only restriction on the use of code, open source advocates argue, software consumers have a diverse array of choices and the most useful or efficient code rises to the top. “Whereas conventional IPRs are used to enact and enforce the principle of exclusion,” Kloppenberg argues, “open source mechanisms use existing law to mandate sharing.”[32] A General Public License for Plant Germplasm (GPL-PG), a legal agreement which would clearly require innovations on germplasm to be made available to the public at no cost and under no restrictions, is a “simple, elegant, and effective” way of restoring food sovereignty to subsistence farmers.[33] Kloppenburg's work is perhaps the most articulate and complete defense of an alternative to the patenting system. Open source software and Creative Commons-licensed copyrighted materials have led to countless free innovations. Importantly, both are voluntary systems which supplement instead of supplant traditional IP protections.[34] A GPL-PG could provide much needed legal clarity where a group of researchers or a seed company sought to donate their breed to the public domain. Importantly, a GPL-PG under those circumstances would protect the breed from future biopiracy by other parties. However, doing so justly requires the prior informed consent of the original breeders, whether indigenous communities or individuals. To implement Kloppenburg's system universally, however, would encroach on the right of participation and principle of subsidiarity for the same reasons the status quo does and to the same degree.

Policy Innovation – IPR for Indigenous Communities

Indigenous communities face particular difficulties in a public domain system. Biopiracy occurs where traditional knowledge is poorly documented, leaving patent-issuing countries like the United States with no evidence that knowledge cannot be appropriated, modified and patented by another party:

> Native peoples once stood for the commons. But in the advent of an awareness of the valuable genetic and knowledge resources within native communities and lesser developed nations, the advocates for the public domain – and, in turn, propertization – have flipped. Now, corporations declare the trees and the shaman's lore to be the public domain, while indigenous peoples demand property rights in these resources."[35]

Ultimately, Chander and Sunder argue, the public domain leaves the party looking to recognize its rights at the mercy of an unregulated market. In that market, circumstances like knowledge, wealth, power and education leave seed companies better able to compete than indigenous communities.[36] While Kloppenburg's framework provides guidance for good policy at the level of seed sales, it does not provide the best solution for germplasm appropriation: there, claims of indigenous communities to their traditional knowledge require greater recognition. In order to do so, countries must promote patent regimes which are not only strong, but flexible and innovative.

A handful of countries have begun protecting traditional knowledge by law. In the Philippines, a 1995 law permits appropriation of germplasm only with the prior informed consent of local communities and the creation of a bioprospecting agreement with the government.[37] The law universally prevents the appropriation of traditional knowledge used by indigenous communities. A 1998 biodiversity law in Costa Rica declares that the state the owner of the country's biological resources and requires state permission, the prior informed consent of local communities and royalty-sharing with those communities for appropriation. Brazil, Panama, Portugal, Peru and at least 20 other countries protect traditional knowledge by statute; ASEAN and the African Union have all proposed laws to do so in the past.[38] Of note also are a 2004 law by the Australian province of Queensland requiring state consent and benefit sharing provisions[39] and U.S. regulations which require state consent for bioprospecting in Yellowstone National Park.[40] The principle of subsidiarity suggests the consent of communities themselves is the important criterion for regulation. Particularly regarding traditional knowledge, it is the community and not the state that maintains ownership rights. State consent can play an important oversight role by ensuring benefits are properly distributed and the prior informed consent of indigenous communities is obtained. Ultimately, however, subsidiarity requires that decision-making authority rest within the communities themselves.

As an alternative to biopiracy, bioprospecting agreements – which provide short and long term payments to the “producers and stewards of genetic resources” in return for access or commercial rights[41] – can provide fair compensation if designed with the individual community in mind. As argued in Chapter IV, indigenous communities are ill-equipped to market their traditional knowledge. So long as those communities are fairly compensated, there is nothing inherently unjust with seed companies marketing traditional knowledge on their behalf. Some 100 countries have introduced or are developing laws to regulate access to genetic resources and provide for benefit sharing.[42] These contracts, while providing monetary and non-monetary compensation, acknowledge that ultimate control over the resource rests with the indigenous community, which makes the decision to bring the resource to market.[43] In the agreements, non-monetary benefits are as important, if not more, than monetary ones. The most frequently mentioned non-monetary benefits include access to seeds, participation in the definition of breeding goals, participatory breeding processes and strengthening of farmers' seed systems.[44] For the reasons previously mentioned, these should not be considered forms of compensation per se but rights of control essential to indigenous communities which should be guaranteed in every bioprospecting agreement. Beyond these essential protections, royalty payments in the form of community investment, when ultimately controlled by the communities themselves, can achieve authentic human development. Unlike alternative arrangements in which outsiders can encroach on a community's genetic resources in exchange for an objectively-determined fee,[45] bioprospecting agreements preserve the sovereignty of indigenous communities over each application of traditional knowledge. By preserving that essential control, the agreements remedy market failures without infringing on the right of participation.

A 1991 agreement between Merek and the Costa Rican NGO INBio provided a model for future bioprospecting agreements.[46] As part of the agreement, INBio provided Merek with access to certain chemical extracts it held on behalf of indigenous communities in exchange for payments to a trust which benefited them.[47] Importantly, the payments by Merek were both a lump sum payment up front – up to $1 million in cash and $130,000 in equipment – but also royalties on the sale of future drugs.[48] In doing so, Merek implicitly acknowledges both that access itself has economic value and that indigenous groups are entitled to share in the profitability of their traditional knowledge. Coughlin cites the INBio agreement as an important example of the powerful flexibility contained in the CBD: while negotiations over technology transfer rights in treaties can feel like an "all-or-nothing struggle for rights over the entire universe of technology," negotiations in individual cases may lead both parties to more reasonable concessions.[49] By making its database freely available for non-commercial purposes while maintaining rigorous control over commercial uses of its information, INBio successfully maintains an appropriate power balance between indigenous communities and corporations within existing treaty structures.

A 1997 agreement between the Kani tribes of India and the Tropical Botanic Garden and Research Institute (TBGRI) illustrates how the inadequacy of existing legal regimes may lead indigenous groups to choose bioprospecting agreements. When approached by TBGRI to request use of arogyapacha, a plant whose seeds contain a stimulant, the Kani were divided. While older members of the tribe respected their traditional knowledge as an important secret, younger members were eager to reap the economic benefits of an agreement. A group of elder members of the tribe began pressuring the government to establish firm IPR protections for tribes.[50] The final agreement reached between TBGRI and the Kani establishes a trust that provides self-employment programs for Kani youth. The Kani tribes govern the trust themselves and over 65% of the families in the community are voting members of the trust. The trust is responsible for holding the money, accruing interest, and investing the money into the programs.[51] While it did not come with the complete consensus of an admittedly diverse people, this agreement was the best possible compromise under the circumstances. Under India's regime at the time, the tribe had no legal means to protect its rights through patents or otherwise. TBGRI was not required by law to consult the Kani or share its profits with them.[52] Under those circumstances, TBGRI deserves praise for an agreement which gives most of the families in the community power over the benefits of commercialization. However, members of a tribe do not always share the same opinion. Traditional knowledge is ultimately owned by the community's members in total, not their representatives. Legal agreements and stronger intellectual property laws should respect the right of participation of all members of a community by allowing them to participate in democratic forums which control the use of their germplasm, not just the sharing of benefits after the fact.

Information gathering on PGR to establish the prior ownership of indigenous communities is essential to preventing biopiracy even with bioprospecting agreements. Traditional knowledge databases, which collect this information and use it to act against false claims of novelty in patent applications,[53] serve this function. The choice whether to make the information in databases public or private has been a significant source of disagreement among databases in recent years. Public databases put information in the public domain and establish for the public at large the prior work of indigenous communities. Private databases, while keeping that information secret, are able to prevent the deliberate stealing of traditional knowledge.[54] A database established by the World Bank, which looks to document regional knowledge and techniques for the use of germplasm,[55] is public and was until recently available online. A database run by the government of India is private: employees are bound to non-disclosure agreements and the database is available in full only to patent offices.[56] Unlike a GDL-PG, however, this level of secrecy prevents both public oversight and may enable seed companies to patent varieties which, while taking a significant step from traditional knowledge, are ultimately still based on that knowledge. Hybrid public-private databases offer the most balanced solution. In Ecuador, a database established by the Inter-American Development Bank catalogs traditional knowledge and is maintained at several regional centers.[57] Each community maintains access to its own file but is restricted from accessing other files. Employees independently review the collected knowledge and allow communities with an exclusive right to a piece of knowledge to negotiate its trade terms as they see fit. The Ecuadorian database is unique because it allows indigenous communities to disclose their traditional knowledge as they choose.

Conclusion

When creating policy solutions to the problems posed by seed patenting, national and international bodies must seek the common good by balancing the rights of farmers to control the seeds they plant with the rights of breeders to receive just compensation for seed varieties and traditional knowledge. This balance is achieved through a combination of policies, including human rights agreements, seed sharing laws, open source systems, bioprospecting agreements and traditional knowledge databases. No one of these policies alone is an effective strategy. The seed patent system established by Peru in 1996 is an example of an effective system which links a variety of policies.[58] Peruvian law requires the prior informed consent of indigenous communities to access traditional knowledge, a bioprospecting agreement with compensation when traditional knowledge is commercialized or otherwise exploited, a strict prohibition on patenting an invention based on traditional knowledge without said authorization, a confidential database to protect traditional knowledge not in the public domain and a general trust to which seed companies must contribute when exploiting traditional knowledge with no clear ownership. Because each country faces unique agricultural and social challenges, policy solutions should and must undoubtedly vary according to sovereignty and subsidiarity. However, a series of fundamental rights for both farmers and indigenous communities must be enshrined in human rights agreements and rigorously followed by all countries which participate in seed trading in order for the efforts of any one country to be fully effective. To that end, policymakers who act with good will in genuine pursuit of the goals established by human rights frameworks are the most important element of any development strategy or policy response.

Notes

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VII: Conclusion

Using the principle of authentic human development and the related principles of participation, the right to meaningful work and subsidiarity, this paper has critiqued seed patenting using Catholic social thought. It has sought to draw parallels between secular paradigms such as food sovereignty and Catholic social thought's notion of the true ends of farming for individuals and communities. While recognizing these parallels, it also recognizes that Catholic social thought is unique as an ethical framework which considers work as an inherently human endeavor which is governed simultaneously by human dignity on the one hand and the common good on the other. The eloquence with which John XXIII spoke of farming is perhaps the best illustration of this view. While connected to the land and performing a vocation essential to the growth and development of human societies, farmers retain an inherent dignity. In fact, it is precisely from the basic importance of their work that farmers gain respect.

Each of these related principles is a kind of freedom: the freedom of individuals and communities to choose their own food, the freedom of farmers as laborers to develop themselves through their labors, the freedom of individuals to participate in the political and social lives of their communities where food is concerned, and the freedom of communities and nations to craft their own policies. Under the framework articulated by Benedict XVI in this paper's introduction, these freedoms are made valid by the essential nature of the human person and the person's right to life, food and continued personal development. Development on an international level, according to Catholic social thought, considers persons not as objects of charity but as subjects, with full ability to contribute to their own economic well being and full autonomy to make their own decisions.

In framing the debate over seed patents in these terms, this paper hopes to advance a new approach to the debate over intellectual property law focused on human rights and human dignity. The disparity in participation between international trade agreements on IPR and human rights accords on biodiversity and indigenous rights, particularly by the United States, is a source of particular concern. As pointed out in Chapter II of this paper, however, the United States is not alone in underestimating the stress IPR can place on human rights. While the Holy See's strong activism on access to HIV/AIDS drugs in Africa has defended Catholic notions of property rights, the Curia has yet to muster a similar response to the encroachment upon farmers' rights created by seed patents. Perhaps even more troubling, the unqualified endorsement of seed patenting by the Pontifical Academy of Sciences has significantly distorted the work of Paul VI and John Paul II on person-centered development. While the Academy does not make official Vatican policy, it is difficult for the average Catholic or secular international observer to distinguish between the teaching authority of the Academy and that of the Holy See in general.

Since it began addressing international development in the 1960s, Catholic social thought has maintained that international development based only on technology and obsessed only with results undermines the autonomy of the human person and leads ultimately to development which hinders the flourishing of human communities. Because of this unique approach, this paper has produced policy conclusions which do not definitively call for the strengthening or elimination of patent rights or intellectual property laws. While advocating for the strengthening of intellectual property rights for indigenous communities through institution-building and legal reform, it has also called for seed purchasers to retain a broad right to reuse and resell seeds. A decisively non-ideological approach can still be a principled one. Intellectual property rights are a tool, a means to the end of encouraging human-centered innovation and the economic strengthening of human communities.

In September 2009, during this paper's writing, noted agronomist and Nobel laureate Norman Borlaug died at the age of 95. Borlaug's greatest success, a hybrid strain of drought-resistant dwarf wheat, is widely credited with saving up to a billion lives. The conclusions Borlaug drew from that experience – that high-yield Western crops should be grown the world over – were a chief target of environmentalists and other critics. Though Borlaug's dwarf wheat strain was not genetically engineered, Borlaug became a notable public proponent of the widespread diffusion of GE technologies.[1] In a tone not unlike that of the Pontifical Academy of Sciences, Borlaug dismissed his critics as "fashionable elitists" who would "[cry] out for tractors and fertilizers and irrigation canals" if they spent one month in the developing world.[2] Later in his career, Borlaug would argue population growth, not declining biodiversity, perpetuated global hunger.[3] Yet even Borlaug, perhaps the greatest proponent of genetically engineered seeds of his time, showed great reservation towards patent rights. Commenting on the possibility of dramatic increases in U.S. seed patents, Borlaug said "God help us if that were to happen, we would all starve."[4] An academic research scientist, Borlaug was among the strongest proponents of the free exchange of germplasm.

By contributing his research to the global commons and by working in the field with the very farmers who benefited from his seeds, Borlaug implicitly recognized the need for the kids of freedom called for in Catholic social thought. Throughout his career, Borlaug collaborated with local scientists to develop crops specific to individual countries experiencing famine. The World Food Prize, which Borlaug founded in 1987 to recognize exceptional work in agronomy, has been awarded to scientists around the world for their research work on local agriculture.[5] Working outside the patent system allowed Borlaug to engage in unconditional technology transfer from the United States to Mexico, China, India, Pakistan and the other countries in which he worked. In a 1970 Nobel Peace Prize acceptance speech replete with Biblical imagery, Borlaug invoked the motto of the International Labor Organization which is also frequently attributed to Paul VI: “If you desire peace, cultivate justice, but at the same time cultivate the fields to produce more bread; otherwise there will be no peace.”[6] Many of Borlaug's positions, particularly on the environment and population control, deserve careful scrutiny. Under no circumstances should the positions of any one scientist or policymaker, no matter how heroic, become the unequivocal and unquestioned policy of nations. Still, the tenor of Borlaug's rhetoric and the goals by which he lived his life mark the scientist as among the greatest theorists on the fundamental right of food. As international bodies look to shape the next generation of responses to hunger, they should consider the importance of protecting free scientific research respectful of local needs and oriented ultimately towards the fulfillment of the fundamental needs of persons, research which advances authentic human development. Seed patents, which have created significant barriers to this development, require significant reform and restriction to meet the ethical demands of a fundamental right to food.

Notes

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